SAT Prep Test 4—Reading and Writing
Module 1

DIRECTIONS

The questions in this section address a number of important reading and writing skills. Each question includes one or more passages, which may include a table or graph. Read each passage and question carefully, and then choose the best answer to the question based on the passage(s).

All questions in the section are multiple-choice with four answer choices. Each question has a single best answer.

1 Mark for Review

The Chilean volcano Calabozos is located in _____ area. Therefore, the risk of loss of human life in the event of an eruption is minimal.

Which choice completes the text with the most logical and precise word or phrase?

A. a hazardous

B. an active

C. a mountainous

D. a remote

2 Mark for Review

Contemporaries of American modernist poet H.D. focused only on her important contributions to the Imagist movement in the 1920s, taking _____ view of her work. However, she wrote in a variety of forms and genres, from short, lyrical works to complex, book-length poems.

Which choice completes the text with the most logical and precise word or phrase?

A. an expansive

B. a limited

C. an imaginative

D. a complicated

3 Mark for Review

Since the 1950s, scientists have known that rapid eye movement, or REM, occurs when someone is sleeping. Previous studies attempting to determine the meaning of these eye movements have been unsuccessful in part because these studies relied on human subjects recalling the content of their dreams. A recent study by physiologists Yuta Senzai and Massimo Scanziani has avoided this issue by studying dreaming mice instead. Their results suggest that REM is correlated to changes in direction during the dream.

Which choice best describes the function of the second sentence in the overall structure of the text?

A. It names a problem in the approach taken by Senzai and Scanziani.

B. It introduces the difficulty that the study by Senzai and Scanziani was designed to bypass.

C. It presents the findings of studies done prior to the study by Senzai and Scanziani.

D. It clarifies how others studying REM sleep interpret the study by Senzai and Scanziani.

4 Mark for Review

Electroreception is the ability of an animal to sense the flow of electricity around it by using specialized organs known as electroreceptors. Most species known to use electroreception are fish, including many sharks, elephant fishes, and eels. However, electroreception is not limited to fish. Monotremes, a group of mammals that includes the platypus and some echidnas, have electroreceptors on or near their mouths to help locate prey. There is also some evidence that bees can detect static electricity on flowers.

Which choice best describes the function of the third sentence in the overall structure of the text?

A. It generalizes the phenomenon discussed beyond fishes.

B. It offers another explanation of electroreception that is different from the explanation of how electroreception is used by fishes.

C. It provides more examples of animals with electroreception.

D. It explains how electroreception evolved in monotremes and bees.

5 Mark for Review

Text 1

An animal is said to have a theory of mind when it is able to act according to the mental states of other individuals. Psychologists David Premack and Guy Woodruff studied whether chimpanzees have such a theory of mind. They showed videos of human actors struggling with various problems. The chimpanzees were able to select photographs that showed the best tool to solve each actor's problem.

Text 2

Biologist Daniel J. Povinelli and psychologists Kurt E. Nelson and Sarah T. Boysen have argued that previous research into whether chimpanzees have a theory of mind have not adequately addressed alternative explanations for the chimpanzees' behaviors. Specifically, it may be the case that chimpanzees are following learned behaviors in a known environment, rather than applying a theory of mind in a novel situation.

Based on the texts, how would Povinelli, Nelson, and Boysen (Text 2) most likely respond to Premack and Woodruff (Text 1)?

A. They would argue that nonhuman primates other than chimpanzees, such as baboons and gorillas, may also have a theory of mind.

B. They would argue that the chimpanzees would be able to solve the problems themselves without referencing the photographs by struggling with the situation themselves and eventually determining the correct solution.

C. They would encourage Premack and Woodruff to show the same videos and photographs to other nonhuman primates and compare the other nonhuman primates' reactions to the chimpanzees' reactions.

D. They would suggest that placing the chimpanzee subjects in novel environments, such as rooms distinct from the chimpanzees' regular enclosures, may help better ascertain whether chimpanzees have a theory of mind.

6 Mark for Review

The following text is from Oscar Wilde's 1890 novel *The Picture of Dorian Gray*. Dorian is seeing his portrait, painted by Basil Hallward, for the first time.

> Dorian made no answer, but passed listlessly in front of his picture and turned towards it. When he saw it he drew back, and his cheeks flushed for a moment with pleasure. A look of joy came into his eyes, as if he had recognized himself for the first time. He stood there motionless and in wonder, dimly conscious that Hallward was speaking to him, but not catching the meaning of his words. The sense of his own beauty came on him like a revelation. He had never felt it before.

According to the text, what is true about Dorian?

A. Dorian is distracted by the beauty of the painting.

B. Dorian believes that what Hallward is saying is unimportant.

C. Dorian does not recognize his own image.

D. Dorian is prone to embarrassment.

7 Mark for Review

The following text is from Frederick Marryat's 1847 novel *The Children of the New Forest*.

> The old forester lay awake the whole of this night, reflecting how he should act relative to the children; he felt the great responsibility that he had incurred, and was alarmed when he considered what might be the consequences if his days were shortened. What would become of them—living in so sequestered a spot that few knew even of its existence—totally shut out from the world, and left to their own resources?

Based on the text, what is true about the children?

A. They are isolated from people other than the old forester.

B. They are completely unable to take care of themselves.

C. The old forester is resentful of having to take care of them.

D. They attempt to help the old forester with his responsibilities.

8 Mark for Review

The following text is Baron George Gordon Byron's poem "Answer to _____'s Professions of Affection," written around 1814. The poem is addressed to an unknown person.

> In hearts like thine ne'er may I hold a place
> Till I renounce all sense, all shame, all grace—
> That seat,—like seats, the bane of Freedom's realm,
> But dear to those presiding at the helm—
> Is basely purchased, not with gold alone;
> Add Conscience, too, this bargain is your own—
> 'Tis thine to offer with corrupting art
> The rotten borough of the human heart.

What is the main idea of the text?

A. The speaker is expressing disapproval toward the unknown person.

B. The speaker is unimportant to the unknown person.

C. The speaker is thinking of purchasing a seat.

D. The speaker holds a place in the heart of the unknown person.

9 Mark for Review

Sepsis is a life-threatening condition caused by the body's response to an infection. These infections are typically bacterial but may be fungal, parasitic, or viral. The body's response to these infections leads to increased

inflammation and organ damage. This damage, in turn, results in a weakened immune system, which increases the likelihood of reinfection. In a recent study, a team of doctors and pharmacologists led by Shubham Soni claims that administering ketone esters can reduce inflammation and immune system weakening caused by sepsis.

Which finding from the team led by Soni, if true, would most directly support its claim?

A. Patients with sepsis who were administered ketone esters had fewer signs of inflammation and less organ damage than those administered standard antibiotics.

B. When administered, ketone esters are known to increase blood ketone levels, which in turn are a source of energy for the brain.

C. Both those patients administered ketone esters and those administered standard antibiotics did not have reduced inflammation when treated with medication intended to reduce fever.

D. Those sepsis patients administered ketone esters had reduced inflammation but greater organ damage than those administered standard antibiotics.

10 Mark for Review

Horses' Responses to Novel Objects Based on Number of Handlers

	Only One Handler	Multiple Handlers
No reluctance	45%	25%

Mild reluctance	42%	49%
Strong reluctance	13%	26%

Horses have been domesticated for thousands of years. Therefore, they show great sensitivity to the emotions of humans. Biologist Océane Liehrmann from the University of Turku, Finland, led a team of researchers in a study of horses to determine the effect of the number of handlers (either only one person or multiple people) on the horses' responses to a novel object. The researchers determined that horses with only one handler were less reluctant to interact with the novel object than were horses with multiple handlers. For example, 45% of horses with only one handler had no reluctance when interacting with a novel object while _____

Which choice most effectively uses data from the table to complete the example?

A. 13% of horses with only one handler had strong reluctance.

B. 25% of horses with multiple handlers had no reluctance.

C. 26% of horses with multiple handlers had strong reluctance.

D. 42% of horses with only one handler had mild reluctance.

11 Mark for Review

Indian Lok Sabha Results by Percentage of Seats Won, 1999–2019

Party	1999	2004	2009	2014	2019
Bharatiya Janata Party	33%	25%	21%	52%	56%
Indian National Congress	21%	27%	38%	8%	10%
Communist Party of India (Marxist)	6%	8%	4%	7%	4%
Other	40%	40%	37%	33%	30%

India is the largest democracy in the world, with over 614 million people voting in the 2019 election for the Lok Sabha, the parliament of the federal government. In the early years of Indian independence, from the first election in 1951–52 through the eighth Lok Sabha in 1984, each election resulted in one party winning the majority of seats. However, starting with the 1989 election, the party with the largest number of seats failed to win more than half of the total seats. This trend was eventually broken by the Bharatiya Janata Party, which _____

Which choice most effectively uses data from the graph to illustrate the claim?

A. went from holding the second most seats among the top 3 parties in parliament in 2004 and 2009 to holding a majority of seats in 2014 and 2019.

B. reached its highest percentage of seats the same year that the Indian National Congress had its lowest percentage of seats over the same time period.

C. won a lower percentage of seats in the 2009 election than in the 2004 election.

D. had a lower percentage of seats than the Indian National Congress in 2004 but a higher percentage of seats than the Indian National Congress in 1999.

12 Mark for Review

Changes in Indicators of Fatty Liver Disease in Vitamin B12 and Placebo Groups

Indicator	Vitamin B12 Group	Control Group
Steatosis values (dB/cm/MHz)	–0.41	–0.30
Fibrosis values (kPa)	–0.35	0.10
Fasting blood glucose (mg/dl)	–5.00	–1.50
Fasting serum insulin (μU/ml)	–1.46	–0.21
Homeostasis model assessment of insulin resistance (HOMA-IR)	–0.23	0.06

Fatty liver disease (FLD) occurs when excess fat builds up in the liver. While there are often few or no symptoms of FLD, if left untreated, it can lead to cirrhosis or liver cancer. Because FLD is often asymptomatic, doctors and researchers rely on indicators such as steatosis (retention of fat in the liver), fibrosis (scarring), blood glucose (sugar), serum insulin, and insulin resistance to measure and track the development of FLD. A group of researchers led by radiologist Hamid Reza Talari hypothesized that those who take vitamin B12 would experience improvements in fibrosis and insulin resistance when compared to a control group over the same time period.

Which choice best describes data from the table that support the researchers' hypothesis?

A. Those in the control group had decreases in their steatosis values and fasting blood glucose but had increases in fibrosis values and HOMA-IR.

B. Those in the vitamin B12 group had decreases in fibrosis values and HOMA-IR levels, whereas those in the control group had increases in these same values.

C. Both those in the vitamin B12 group and the control group had decreases in their steatosis values.

D. Those in the control group had a decrease in their fasting blood glucose, but those in the vitamin B12 group had an increase in their fasting blood glucose.

13 Mark for Review

Mean Levels of Carbon Monoxide (ppm), November 18–26, 1966

City	Day of the Month of November								
	18	19	20	21	22	23	24	25	26
Newark, NJ	16	14	15	21	23	28	32	27	21
New York, NY	4	3	1	2	3	6	7	13	8
Philadelphia, PA	6	0	0	0	1	6	9	10	6
Washington, D.C.	4	2	3	0	0	0	0	0	0

The air pollution produced in an area is only one factor in that area's air quality. Weather patterns, in particular wind and the movement of air masses, can affect the concentration of pollutants such as carbon monoxide. During a smog event that occurred in the northeastern United States in November 1966, levels of carbon monoxide were recorded in Newark, New Jersey, the origin of the smog event, as well as neighboring city New York, NY, and more distant cities such as Philadelphia, PA, and Washington, D.C. The localized nature of weather patterns during this event can be seen by comparing Newark, NJ, and New York, NY, with _____

Which choice most effectively uses data from the table to complete the statement?

A. Washington, D.C., on the 18th and the 19th.

B. Philadelphia, PA, on the 23rd and the 25th.

C. Philadelphia, PA, on the 24th and the 26th.

D. Washington, D.C., on the 23rd and the 24th.

14 Mark for Review

Neurons respond to stimuli from sensory organs or other neurons. Learning occurs when neurons change how they respond to stimuli based on previous experience, which is a property of memory. Electrical engineers seek to replicate similar processes in their development of computer memory. Recently, research by electrical engineer Mohammad Samizadeh Nikoo has demonstrated that vanadium dioxide (VO_2) has a similar memory property to that of neurons, suggesting that _____

Which choice most logically completes the text?

A. VO_2 could be used in the development of computer memory.

B. neurons use VO_2 when forming memories.

C. VO_2 can learn to respond to stimuli from sensory organs.

D. electrical engineers can now use neurons to develop computer memory.

15 Mark for Review

Uruguayan-Spanish author Carmen Posadas has written the children's books *Juego de Niños* (*Child's Play*) and *La Cinta Roja* (*The Red Ribbon*). Currently, _____ available in over fifty countries and thirty languages.

Which choice completes the text so that it conforms to the conventions of Standard English?

A. some are

B. this is

C. they are

D. it is

16 Mark for Review

During a meeting, a group of twelve young deaf people shared their feelings of isolation and their desire for support. In 1988, the group worked together to form Action Deaf Youth, an _____ provides services and programs for deaf children and youth throughout Northern Ireland.

Which choice completes the text so that it conforms to the conventions of Standard English?

A. organization, that

B. organization

C. organization that

D. organization,

17 Mark for Review

In 1986, after a 56-day expedition, Ann Bancroft became the first woman to reach the North Pole. Her experience as a physical education teacher and her leadership of the first all-female team to cross the ice to the South _____ her to create a foundation that supports girls in pursuing their dreams.

Which choice completes the text so that it conforms to the conventions of Standard English?

A. Pole to inspire

B. Pole that inspired

C. Pole, inspiring

D. Pole inspired

18 Mark for Review

American artist Simone Leigh creates art in various mediums, including sculptures, video, and _____ the themes and images in her artwork, Leigh has emphasized that Black women are her primary audience and that they would be familiar with the allusions in her work.

Which choice completes the text so that it conforms to the conventions of Standard English?

A. performance. Discussing

B. performance discussing

C. performance and discussing

D. performance, discussing

19 Mark for Review

Japanese origamist Akira Yoshizawa is considered the grandmaster of origami, creating more than 50,000 models as well as wet-folding, the most well-known of his invented techniques. _____ dampening the paper before folding, leading to origami models with rounder and more sculpted looks.

Which choice completes the text so that it conforms to the conventions of Standard English?

A. It involves

B. They involve

C. One involves

D. These involve

20 Mark for Review

Chinese artist Xu Bing is known for his art installations that showcase his printmaking skills and his creative use of languages and texts. His 1991 installation *A Book from the Sky*, for example, consists of volumes and scrolls printed with characters he invented, while his 2004 installation *The*

Glassy Surface of a _____ uses the text of Henry David Thoreau's *Walden* to create the illusion of a lake.

Which choice completes the text so that it conforms to the conventions of Standard English?

A. *Lake*:

B. *Lake*

C. *Lake*,

D. *Lake*—

21 Mark for Review

Developed along with the swing style of jazz music in the 1920s, swing dance is a group of social dances that once comprised hundreds of styles. Not all of the styles survived beyond that time _____ the dances that are still popular today include Lindy Hop, Balboa, Collegiate Shag, and Charleston.

Which choice completes the text so that it conforms to the conventions of Standard English?

A. period; however,

B. period, however;

C. period, however,

D. period, however

22 Mark for Review

Evolutionary biologist Jonathan Calede may have discovered the oldest amphibious beaver species in the world. Calede first compared measurements of the beaver's ankle to those of almost 350 other rodent species to learn more about how it moved. _____ Calede dated the species to approximately 30 million years ago based on its location between rock and ash layers.

Which choice completes the text with the most logical transition?

A. For example,

B. In conclusion,

C. Next,

D. In fact,

23 Mark for Review

Male and female American citizens had starkly different roles during World War II. Men served as soldiers or took part in the workforce to create weapons and other wartime materials. _____ women were responsible for maintaining the home and supporting the men. Some women also ventured into the workforce for the first time, and the famous

"We Can Do It" poster featuring "Rosie the Riveter" was created to motivate women to pursue this new role.

Which choice completes the text with the most logical transition?

A. Besides,

B. Instead,

C. Likewise,

D. Meanwhile,

24 Mark for Review

While treatment for hearing loss is typically associated with the ears, some patients with damaged ear structures are not able to use traditional cochlear implants. _____ researchers are working to develop hearing aids anchored to patients' bones in order to combat hearing loss through vibrations in the skull.

Which choice completes the text with the most logical transition?

A. Secondly,

B. In addition,

C. Finally,

D. Hence,

25 Mark for Review

Korean artist Anicka Yi uses a unique process and materials to generate her art installations. Her materials are often perishable and biological, such as soap and flowers, and are not traditionally used for artwork. _____ Yi spends almost as much time transforming these substances into completely new materials as she does creating the actual art pieces.

Which choice completes the text with the most logical transition?

A. Meanwhile,

B. Instead,

C. In fact,

D. To conclude,

26 Mark for Review

While researching a topic, a student has taken the following notes:

- A writing system for expressing numbers is a numeral system.
- Two examples of numeral systems from history are Babylonian cuneiform numerals and Roman numerals.
- The Babylonian cuneiform numeral system is a base-60 system and lacks a zero digit.
- It's a positional numeral system in which the position of a digit affects its value.
- The Roman numeral system is a base-10 system and lacks a zero digit.

- It’s a non-positional numeral system in which the position of a digit does not affect its value.

The student wants to emphasize a difference between the two numeral systems. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A. Babylonian cuneiform numerals and Roman numerals are two writing systems for expressing numbers.

B. The Roman numeral system is a base-10 non-positional system that lacks a zero digit.

C. One system for expressing numbers is Babylonian cuneiform; however, another one is the Roman numeral system.

D. The Babylonian cuneiform numeral system is base-60 and positional, while the Roman numeral system is base-10 and non-positional.

27 Mark for Review

While researching a topic, a student has taken the following notes:

- Archaeologists studied the burial of an individual at the Newen Antug site in Argentinian Patagonia.
- The individual was buried in a wooden structure over 800 years ago.
- An analysis of the structure revealed that it was carved from a tree with excellent buoyancy.
- The wooden structure was a canoe, suggesting that canoes were used as coffins at that time.

The student wants to present the Newen Antug study and its conclusions. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A. The burial site of an individual over 800 years ago was found at the Newen Antug site in Argentinian Patagonia.

B. Archaeologists studied the burial site of an individual who was buried at the Newen Antug site over 800 years ago.

C. An analysis of a burial site at the Newen Antug site in Argentinian Patagonia provided evidence that canoes were used as coffins over 800 years ago.

D. As part of a study of a burial site at the Newen Antug site in Argentinian Patagonia, a wooden structure buried with an individual was analyzed.

YIELD

Once you've finished (or run out of time for) this section, use the answer key to determine how many questions you got right. If you got fewer than 15 questions right, move on to Module 2—Easier, otherwise move on to Module 2—Harder.

SAT Prep Test 4—Reading and Writing
Module 2—Easier

DIRECTIONS

The questions in this section address a number of important reading and writing skills. Each question includes one or more passages, which may include a table or graph. Read each passage and question carefully, and then choose the best answer to the question based on the passage(s).

All questions in the section are multiple-choice with four answer choices. Each question has a single best answer.

1 Mark for Review

Shakespeare intentionally provided no stage directions for his play *Macbeth* regarding whether to have Banquo's ghost physically present on stage or simply to have Macbeth react fearfully to something invisible, thus providing future directors with the _____ to indulge their own artistic interpretations.

Which choice completes the text with the most logical and precise word or phrase?

A. confusion

B. dedication

C. instruction

D. liberty

2 Mark for Review

German-Dutch paleontologist Ralph von Koenigswald was the first to discover the fossilized remains of *Gigantopithecus blacki*, a gargantuan ape believed to have lived during the Pleistocene Epoch. Because the fossils were exclusively found in caves in southern China, many experts believe that the species was _____ that region—that is, anyone claiming to have found remains of *Gigantopithecus* elsewhere would be mistaken.

Which choice completes the text with the most logical and precise word or phrase?

A. restricted to

B. eliminated from

C. common in

D. unknown to

3 Mark for Review

Computer scientist Ray Kurzweil _____ that although artificial intelligence will not displace human beings, it will undoubtedly become smarter than people within this generation. This possibility has been the

domain of science fiction writers for decades, whose works explore the ramifications of just such a future.

Which choice completes the text with the most logical and precise word or phrase?

A. proves

B. requires

C. predicts

D. denies

4 Mark for Review

In psychology, it's critical not to generalize from the results of studies in which the subjects are not representative of the larger population. The infamous Stanford Prison Experiment _____ this principle: the participants, whose behavior supposedly demonstrated the "human" tendency toward alarming aggression in authoritarian situations, were a handful of male college-age individuals from the same private university in California rather than a diverse sampling of subjects.

Which choice completes the text with the most logical and precise word or phrase?

A. illustrates

B. refutes

C. supersedes

D. critiques

5 Mark for Review

Neurologists know that prosopagnosia—the _____ to recognize faces—involves a specific lesion in the brain and can be caused by disease or head injury. However, prominent author Dr. Oliver Sacks believes that this "face blindness" also has a definite genetic component.

Which choice completes the text with the most logical and precise word or phrase?

A. capability

B. incapacity

C. tendency

D. reluctance

6 Mark for Review

The shark's competitive advantage in the oceanic ecosystem is principally due to electroreception, or the ability to detect electrical impulses. Marine biologists believe that this heightened _____ to electrical stimuli allows the shark to easily find its prey, for as fish swim through water, their movement produces minute electrical signals.

Which choice completes the text with the most logical and precise word or phrase?

A. allergy

B. sensitivity

C. indifference

D. aversion

7 Mark for Review

The Voynich manuscript was written on vellum dating from the fifteenth century in a script that is not found in any other source. Since cryptographers have yet to demonstrably decipher any portion of the text, the meaning and purpose of the Voynich manuscript remain _____ .

Which choice completes the text with the most logical and precise word or phrase?

A. enigmatic

B. venerable

C. multifarious

D. coherent

8 Mark for Review

It is commonly believed that, in the complex ecosystem of the Nile River in Africa, the crocodile and the Egyptian plover bird have formed an _____ relationship: the crocodile opens its mouth and keeps it open while the bird instinctively eats the food particles remaining in the crocodile's teeth, thus nourishing the bird while simultaneously promoting the crocodile's dental health.

Which choice completes the text with the most logical and precise word or phrase?

A. interdependent

B. inexplicable

C. enthralling

D. inarticulate

9 Mark for Review

The following text is from Herman Melville's 1924 short novel *Billy Budd* and pertains to Edward Vere, the captain of the ship on which Billy is sailing.

> Captain the Honorable Edward Fairfax Vere, to give his full title, was a bachelor of forty or thereabouts, a sailor of distinction even in a time prolific of renowned seamen. Though allied to the higher nobility, his advancement had not been altogether owing to influences connected

with that circumstance. He had seen much service, been in various engagements, always acquitting himself as an officer mindful of the welfare of his men, but never tolerating an infraction of discipline; thoroughly versed in the science of his profession, and intrepid to the verge of temerity, though never injudiciously so.

According to the text, what is true of Captain Vere?

A. He dislikes many of the men who serve under him.

B. He is proud of his aristocratic background.

C. He is a capable and evenhanded naval officer.

D. He prefers navy life to life outside the navy.

10 Mark for Review

"I Remember, I Remember" is an 1844 poem by Thomas Hood. The poem conveys the speaker's sadness that his life as an adult does not compare favorably to his childhood: _____

Which quotation from the poem most effectively illustrates the claim?

A. "The lilacs where the robin built, / And where my brother set / The laburnum on his birthday,— / The tree is living yet!"

B. "I remember, I remember, / The house where I was born, / The little window where the sun / Came peeping in at morn."

C. “I remember, I remember, / The roses, red and white, / The vi’lets, and the lily-cups, / Those flowers made of light!”

D. “It was a childish ignorance,/ But now ‘tis little joy / To know I’m farther off from heav’n / Than when I was a boy.”

11 Mark for Review

Dracula is an 1897 novel by Bram Stoker. In the story, English lawyer Jonathan Harker has traveled to Transylvania to conduct business with Count Dracula at his castle. In his journal, Harker conveys his belief that he has become Dracula’s prisoner: _____

Which quotation from Jonathan Harker’s journal most effectively illustrates the claim?

A. “What manner of man is this, or what manner of creature, is it in the semblance of man? I feel the dread of this horrible place overpowering me.”

B. “My lamp seemed to be of little effect in the brilliant moonlight, but I was glad to have it with me, for there was a dread loneliness in the place which chilled my heart and made my nerves tremble.”

C. “I start at my own shadow, and am full of all sorts of horrible imaginings. God knows that there is ground for my terrible fear in this accursed place!”

D. “I rushed up and down the stairs, trying every door and peering out of every window I could find, but after a little the conviction of my

helplessness overpowered all other feelings."

12 Mark for Review

"In Flanders Fields" is a 1915 poem written by Lieutenant-Colonel John McCrae, a Canadian military officer who died three years later in World War I. The poem is meant to be a plea toward others to join the war effort, as is evident by the following lines: _____

Which quotation from "In Flanders Fields" most effectively illustrates the claim?

A. "Loved and were loved and now we lie / In Flanders fields"

B. "In Flanders fields the poppies blow / Between the crosses row on row"

C. "To you from failing hands we throw / The torch; be yours to hold it high"

D. "We are the dead. Short days ago / We lived, felt dawn, saw sunset glow"

13 Mark for Review

The curator of a museum claims that a dress in his possession was worn by the wife of one of Lincoln's generals at the presidential inauguration in 1865. Radiocarbon dating, which dates organic material with an error range of about thirty years in either direction, was performed on the sleeves of the

dress, revealing that they date back to the 1975–2005 period. If both the curator's claim and the radiocarbon dating analysis are correct, that would suggest that _____

Which choice most logically completes the text?

A. the dress was made sometime between 1835 and 1895 and then damaged sometime after 1975.

B. vintage dresses are more commonly recovered from the late twentieth and early twenty-first centuries than from the mid-nineteenth century.

C. over one hundred years after the dress was made, its sleeves were replaced.

D. the dress was made from material different from that used for most dresses in the nineteenth century.

14 Mark for Review

In the early 1900s, paleontologists largely believed that there were no undocumented prehistoric aquatic species that had survived to the present day because it would be impossible for such a species to have enough animals to sustain a breeding population while escaping detection in the modern era. However, a coelacanth, a large lobe-finned fish universally believed by scientists to have gone extinct sixty-six million years ago, was found off the coast of South Africa as recently as 1938. This event may suggest that _____

Which choice most logically completes the text?

A. fewer coelacanths are required to sustain a breeding population than was previously thought.

B. it is possible for a prehistoric species to go undiscovered for longer than expected.

C. the scientists who determined that the coelacanth was extinct ignored critical evidence.

D. the same environmental conditions that eliminated the dinosaurs nearly killed off the coelacanths.

15 Mark for Review

The *door-in-the-face* technique involves initially making an outrageous or unappealing request or offer, which the other person is highly likely to refuse, then following up with a more reasonable one. The subject is more likely to look favorably upon this second request or offer because it seems acceptable compared to the initial proposition. So, if an employee wants the best raise in annual salary from her boss that she can get, she might succeed by asking for a _____

Which choice most logically completes the text?

A. 50% raise, then asking for a 5% raise.

B. 3% raise, then asking for a 2% raise.

C. 10% raise, then asking for a 50% raise.

D. 3% raise, then asking for a 3% raise again.

16 Mark for Review

The North American Free Trade Agreement (NAFTA) was an agreement among the United States, Canada, and Mexico that was in effect between 1994 and 2020. During this time, the number of manufacturing jobs in the United States and Canada declined, but the total number of manufacturing jobs in the countries covered by NAFTA increased. This suggests that, between 1994 and 2020, _____

Which choice most logically completes the text?

A. the number of manufacturing jobs in Mexico increased by a greater amount than the combined decreases in the United States and Canada.

B. NAFTA made it more difficult for manufacturers to establish factories in the United States and Canada.

C. the cost of manufacturing goods in the area covered by NAFTA decreased.

D. complex goods, such as automobiles and electronics, were increasingly manufactured in the United States, Canada, and Mexico.

17 Mark for Review

American chef Alice Waters is well-known for opening the restaurant Chez Panisse, which _____ the farm-to-table movement by serving local

and seasonal food.

Which choice completes the text so that it conforms to the conventions of Standard English?

A. originating

B. to originate

C. having originated

D. originated

18 Mark for Review

American activists Dolores Huerta and Cesar Chavez founded the National Farm Workers Association in 1962 to defend the rights of farm workers through nonviolent organizing tactics, such as marches and boycotts. _____ organization merged with the Agricultural Workers Organizing Committee, led by Larry Itliong, to form United Farm Workers, a labor union that advocates on behalf of farm workers across the U.S.

Which choice completes the text so that it conforms to the conventions of Standard English?

A. Its

B. Their

C. It’s

D. They’re

19 Mark for Review

Researchers at the University of York found that people who are highly individualistic feel less connected to the natural world and engage in fewer activities to improve the environment; however, engaging with nature through activities such as walking and bird-watching can reconnect _____ to the natural world and encourage environmentally-friendly behaviors.

Which choice completes the text so that it conforms to the conventions of Standard English?

A. it

B. you

C. one

D. them

20 Mark for Review

National flags are designed to best represent and symbolize the individual _____ when countries share a history or culture, their flags are designed to look similar, thus creating a flag family that shares colors, shapes, or other elements.

Which choice completes the text so that it conforms to the conventions of Standard English?

A. country but

B. country,

C. country

D. country, but

21 Mark for Review

Scientists at the University of Illinois and the University of Lancaster observed that plants under very bright sunlight enter a protective mode for several minutes, during which they stop photosynthesizing and growing. If the crops were genetically modified to have a shorter time in protective mode, _____ The scientists resolved to find out.

Which choice completes the text so that it conforms to the conventions of Standard English?

A. could the crop yield increase?

B. the crop yield could increase?

C. the crop yield could increase.

D. could the crop yield increase.

22 Mark for Review

Take Our Daughters and Sons to Work Day originally started as a day focused on engaging girls with the workforce, Take Our Daughters to Work Day. On the national day, the fourth Tuesday in April, parents and caregivers go to work with their children; shadowing their parents or caregivers _____ children real-world experience and ideas for potential future careers.

Which choice completes the text so that it conforms to the conventions of Standard English?

A. offer

B. have offered

C. are offering

D. offers

23 Mark for Review

In order to allow olive ridley turtles to lay eggs on Versova Beach in Mumbai, community activist Afroz Shah organized a large group of volunteers to remove over 11 million pounds of trash. The beach now allows community members to connect with the natural world and _____ a healthy habitat for olive ridley turtles to use after a twenty-year absence.

Which choice completes the text so that it conforms to the conventions of Standard English?

A. provided

B. providing

C. provides

D. provide

24 Mark for Review

Yoga is an ancient discipline from India that aims to combine physical fitness with mental and spiritual control and calm and has expanded to become popular with many different cultures. _____ yoga is shifting into different forms to allow a wider range of people to participate. For example, accessible yoga provides opportunities for those with physical disabilities to access the health and mental benefits of the practice.

Which choice completes the text with the most logical transition?

A. Nevertheless,

B. Similarly,

C. Thus,

D. Currently,

25 Mark for Review

Scientists often disagree about what traits to use to place newly discovered species in the tree of life and debate different ways to organize evolutionary relationships. *Chimerarachne yingi,* _____ is an extinct arachnid species that is sometimes placed near modern spiders based on its acquisition of silk-spinning organs or near other arachnids based on its loss of a tail.

Which choice completes the text with the most logical transition?

A. as a result,

B. in comparison,

C. for example,

D. still,

26 Mark for Review

In 2011, a seismometer detected seismic activity from a magnitude 8.9 earthquake and automatically cut the power to all 30 bullet trains in Japan, potentially avoiding mass architectural damage to the tracks. _____ the cut to the power prevented citizens from being caught in a dangerous location during the earthquake and allowed riders to seek shelter.

Which choice completes the text with the most logical transition?

A. In addition,

B. In comparison,

C. For example,

D. Specifically,

27 Mark for Review

While researching a topic, a student has taken the following notes:

- The Endangered Species Act (ESA) was enacted in 1973 to recover species and prevent extinction.
- A species is listed under the ESA when it's determined that the species needs protection and delisted when the population has recovered.
- Only 54 of the over 1,000 listed species have been delisted from the ESA, raising concerns about the effectiveness of the ESA.
- Erich Eberhard, David Wilcove, and Andrew Dobson conducted an analysis of population trends of species listed under the ESA.
- They found that most species had to wait multiple years before being listed and by then their populations were already so low that recovery was much more difficult.

The student wants to make a generalization about the kind of study conducted by Eberhard, Wilcove, and Dobson. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A. Scientists have analyzed population trends to find out the impact of legal protections in the realm of conservation.

B. Species listed under the ESA have low population levels when they are listed.

C. Only 54 once-listed species have been delisted; many more species have not recovered and are still listed.

D. Based on an analysis of population trends, Eberhard, Wilcove, and Dobson found that species listed under the ESA have very small populations when listed.

S T O P

If you finish before time is called, you may check your work on this module only.
Do not turn to any other module in the test.

SAT Prep Test 2—Reading and Writing
Module 2—Harder

DIRECTIONS

The questions in this section address a number of important reading and writing skills. Each question includes one or more passages, which may include a table or graph. Read each passage and question carefully, and then choose the best answer to the question based on the passage(s).

All questions in the section are multiple-choice with four answer choices. Each question has a single best answer.

1 Mark for Review

Dutch philosopher Baruch Spinoza argued as part of his rejection of dualism that all things, living or not, have the inclination to continue to exist and enhance themselves, a property he named "conatus." All things, he believed, had the tendency to _____ and would only cease to be if acted upon by outside forces.

Which choice completes the text with the most logical and precise word or phrase?

A. deteriorate

B. perish

C. persevere

D. disappear

2 Mark for Review

Many species demonstrate rescue behavior, a behavior in which an individual will help another in distress without any obvious benefit to the helper. In fact, this behavior _____ a recent study of Australian magpies when some birds in the study helped other birds remove the trackers that researchers had placed upon them, making it more difficult for the researchers to obtain data.

Which choice completes the text with the most logical and precise word or phrase?

A. aided

B. impeded

C. clarified

D. exposed

3 Mark for Review

Dutch artist M.C. Escher's work uses _____ to engage viewers by employing mathematical and intuitive processes to create images of objects that at first appear normal but on closer inspection are, in fact, impossible.

Which choice completes the text with the most logical and precise word or phrase?

A. geometry

B. beauty

C. paradox

D. color

4 Mark for Review

Typically, pure water is not considered particularly _____ , but a team of scientists led by Richard Zare has discovered how microdroplets of water can turn into caustic hydrogen peroxide. When microdroplets of water hit a solid surface, an electric charge jumps between the water and the solid, producing hydroxyl radicals that, in turn, combine with remaining oxygen to form hydrogen peroxide.

Which choice completes the text with the most logical and precise word or phrase?

A. viable

B. contaminated

C. common

D. reactive

5 Mark for Review

The Beat Generation, a literary subculture movement featured in works such as Allen Ginsberg's *Howl* (1956) and William S. Burroughs's *Naked Lunch* (1959), was characterized by its _____ the traditional values of the 1950s. The movement's central message of nonconformity would be criticized by American literary critic Manuel Luis Martinez, who believed that the Beat Generation's lack of attention to the politics of individualism undermined the movement's goals.

Which choice completes the text with the most logical and precise word or phrase?

A. dissension from

B. gratitude toward

C. adherence to

D. deference to

6 Mark for Review

The possibility of recycling used car tires as building materials is _____ indeed: the disposal of used tires is a major environmental problem, so potentially reusing them would be beneficial. Furthermore, initial studies have shown that walls made of used tires and dirt are more structurally robust than those made of concrete.

Which choice completes the text with the most logical and precise word or phrase?

A. derivative

B. ludicrous

C. auspicious

D. innovative

7 Mark for Review

The Voynich manuscript was written on vellum dating from the fifteenth century in a script that is not found in any other source. Since cryptographers have yet to demonstrably decipher any portion of the text, the meaning and purpose of the Voynich manuscript remain _____ .

Which choice completes the text with the most logical and precise word or phrase?

A. enigmatic

B. venerable

C. multifarious

D. coherent

8 Mark for Review

Astronautics owes much to the _____ contributions of Charles E. Whitsett. His ground-breaking development of the manned maneuvering unit enabled the first spacewalks in which astronauts were not tethered to a spacecraft.

Which choice completes the text with the most logical and precise word or phrase?

A. dubious

B. futile

C. galvanizing

D. avant-garde

9 Mark for Review

The following text is adapted from Charles Dickens's 1859 novel *A Tale of Two Cities*. Mr. Lorry, traveling to France on business, is delivering some news to Miss Manette, the daughter of one of his friends.

> "Miss Manette, I am a man of business. I have a business charge to acquit myself of. In your reception of it, don't heed me any more than if I was a speaking machine—truly, I am not much else. I will, with your leave, relate to you, miss, the story of one of our customers."
>
> "Story!"

He seemed wilfully to mistake the word she had repeated, when he added, in a hurry, "Yes, customers; in the banking business we usually call our connection our customers. He was a French gentleman; a scientific gentleman; a man of great acquirements—a Doctor."

Based on the text, how does Mr. Lorry interact with Miss Manette?

A. Although he claims to be uninterested in the news, he makes purposeful decisions during his conversation with Miss Manette.

B. Although he is a professional, he misunderstands Miss Manette's interjection.

C. Although he acts as if the news has no importance to him, he cannot keep the details of the story accurate.

D. Although he is unthinkingly following directions, he is flustered by Miss Manette's rudeness.

10 Mark for Review

Nisga'a poet Jordan Abel addresses the experiences of Indigenous people as European settlers and their descendants took over North America. Abel's first book of poetry, *The Place of Scraps* (2014), uses *Totem Poles*, a 1929 book by anthropologist Marius Barbeau, as source material. Abel claims that his use of Barbeau's text shows how anthropological texts can be used to portray Indigenous people differently based on the author.

Which finding, if true, would most directly support Abel's claim?

A. Abel intersperses Barbeau's text with images of Indigenous people and personal anecdotes written in the third person.

B. Abel explains that Barbeau presented two chiefs feuding over constructing the largest pole as unreasonable, yet other anthropologists claim that such arguments between chiefs of Indigenous tribes were important political exchanges.

C. *The Place of Scraps* won the Dorothy Livesay Poetry Prize and was a finalist for the Gerald Lampert Award.

D. Before Abel wrote *The Place of Scraps*, other Indigenous writers had used texts from anthropologists in their works.

11 Mark for Review

In Japan, adults may be legally adopted into a family. The practice may have started as early as the 13th century CE, but widespread adult adoption dates from the Tokugawa shogunate, a military government which began around 1600 CE. During this time, members of the ruling class would adopt competent adult males, who would then ensure that the family's political and business interests would be sustained. While adult adoption remains a way for individuals to improve their economic and social status, the practice has its detractors as well, with some researchers arguing that it can lead to issues with the adoptee developing a firm sense of identity in his or her new environment.

Which of the following best illustrates the researchers' claim?

A. Adult adoptees are entitled to an inheritance from their adoptive families, strengthening the ties between them, which further encourages the adult adoptee to work to enhance the new family's prosperity.

B. While most adult adoptees typically report improved financial status after adoption, many of those same adoptees also experience higher-than-normal rates of depression and anxiety.

C. Elsewhere in East Asia, such as in China and Korea, families have a traditional obligation to adopt blood relatives who lack more closely-related living kin, but adoptions in Japan are almost exclusively between those with no blood relations.

D. Families with ancestors who were adult adoptees do not distinguish between those ancestors who were members of the family by birth and those who were adopted into the family.

12 Mark for Review

Neurologists have hypothesized that tau protein, the mutation of which is known to cause Alzheimer's disease, is key to controlling glutamate receptors, which are involved in the production of memories. Tau protein does not directly affect glutamate receptors but does inhibit NSF, an enzyme found in the brain.

Which finding, if true, would most directly support the neurologists' hypothesis?

A. Other studies have shown that an excess of NSF has been shown to lead to abnormal glutamate receptor behavior.

B. Patients with Alzheimer's disease have been found to have an excess of NSF in their brains during autopsies.

C. Neurologists do not yet know what causes mutations of tau protein; one hypothesis is that disease leads to these mutations.

D. Other types of dementia are not caused by mutations in tau protein but rather physical damage to the brain.

13 Mark for Review

From 1634 to 1637 CE, tulips in the Dutch Republic sold for extraordinarily high prices, sometimes as much as 10 times the annual wage of a skilled worker, in a phenomenon known as tulip mania. Some economists, such as Charles Kindleberger, argue that tulip mania was the first speculative bubble in history, during which the prices of a commodity (in this case tulip bulbs) do not follow the typical rules of economics. Others, such as Peter Garber, believe that tulip mania is explainable by fundamental economic concepts such as supply and demand.

Which finding, if true, would most directly support Garber's argument?

A. Tulips during this period were very rare, and demand for tulips was fueled in part by the ability to reproduce and sell bulbs, enabling some purchasers to make profits.

B. Some common bulbs, such as the Witte Croonen bulb, saw price increases as dramatic as those of rare bulbs.

C. The prices of tulip bulbs were much higher than could be supported by the banking system in place in 17th century Europe.

D. The tulip mania led to an increase of the supply of gold coins in the Dutch Republic.

14 Mark for Review

The use of pesticides in agriculture poses risks to both humans and the environment, so finding alternative methods of pest control is an important area of research. The use of ants to control pests in China goes back to at least the 4th century CE, and farmers in places such as Kenya, Ghana, and Canada have also used ants to control various organisms. Entomologist Diego Anjos and others have identified several positive effects (services) of ants, such as reducing both the abundance of non-honeydew-producing species and plant damage. However, ants also have negative effects, such as increasing the abundance of honeydew-producing species and spreading pathogens, suggesting that _____

Which choice most logically completes the text?

A. ants may have unintended environmental consequences when used to control pests in certain circumstances.

B. other species may also be effective in providing services to farmers.

C. ants as pest control provide numerous services without serious ramifications.

D. scientists do not yet know whether using ants to control organisms is a net positive in any situation.

15 Mark for Review

Among many animals, such as mice, fruit flies, and humans, each odor that an animal can smell is detected by a particular kind of sensory neuron that has a particular kind of receptor; eliminating that receptor through illness or genetic manipulation results in the inability to smell that odor. A team led by neurobiologist Margo Herre tested whether mosquitoes modified to lack the receptor for smelling blood would be unable to find humans. These mosquitoes were still able to find humans, suggesting that _____

Which choice most logically completes the text?

A. mosquitoes without damage to their odor receptors are more capable of finding humans than those with damage.

B. like mice, fruit flies, and humans, individual mosquitoes with damage to particular receptors will be unable to detect certain odors.

C. researchers cannot assume that mosquitoes have the same correlation between receptors and the ability to sense certain odors that mice, fruit flies, and humans have.

D. researchers can assume that interfering with mosquitoes' odor receptors is a potential way to prevent mosquitoes from feeding on

humans.

16 Mark for Review

The North American Free Trade Agreement (NAFTA) was an agreement among the United States, Canada, and Mexico that was in effect between 1994 and 2020. During this time, the number of manufacturing jobs in the United States and Canada declined, but the total number of manufacturing jobs in the countries covered by NAFTA increased. This suggests that, between 1994 and 2020, _____

Which choice most logically completes the text?

A. the number of manufacturing jobs in Mexico increased by a greater amount than the combined decreases in the United States and Canada.

B. NAFTA made it more difficult for manufacturers to establish factories in the United States and Canada.

C. the cost of manufacturing goods in the area covered by NAFTA decreased.

D. complex goods, such as automobiles and electronics, were increasingly manufactured in the United States, Canada, and Mexico.

17 Mark for Review

Researchers studying the recent eruption of Hunga Tonga–Hunga Ha'apai, a submarine volcano located near the islands of Tonga in the South Pacific,

found that the volcanic cloud, compared to those of other eruptions, _____ the highest ever recorded.

Which choice completes the text so that it conforms to the conventions of Standard English?

A. have been

B. are

C. was

D. were

18 Mark for Review

Connectomes, extensive maps of neural connections in the brain, reveal that each person has a distinct pattern of connections known as a functional fingerprint. In a 2017 study, behavioral _____ found that about one-third of the functional fingerprint is unique to an individual and that other parts are inherited.

Which choice completes the text so that it conforms to the conventions of Standard English?

A. neuroscientist, Damien Fair,

B. neuroscientist Damien Fair

C. neuroscientist Damien Fair,

D. neuroscientist, Damien Fair

19 Mark for Review

Throughout her career, Muscogee Nation member and poet Joy Harjo has edited multiple anthologies that have highlighted Native voices in the U.S. For example, a map showcasing 47 Native Nations poets _____ her signature project during her time as the U.S. Poet Laureate.

Which choice completes the text so that it conforms to the conventions of Standard English?

A. was

B. are

C. have been

D. were

20 Mark for Review

When bees pollinate flowers, they may be exposed to insecticides, potentially affecting their nervous systems. Recently, Dr. Rachel Parkinson of the University of Oxford added the common _____ to a sucralose solution to examine the insecticide's impact on honeybees' ability to walk in a straight line.

Which choice completes the text so that it conforms to the conventions of Standard English?

A. insecticide sulfoxaflor

B. insecticide, sulfoxaflor,

C. insecticide sulfoxaflor,

D. insecticide, sulfoxaflor

21 Mark for Review

In 1946, Juliet Rice Wichman acquired 1,000 acres on Kaua'i, one of the Hawaiian islands, to transform the land into a garden by removing grazing cattle and restoring terraces to grow taro. Wichman's work to preserve the culture of Kaua'i wasn't _____ as the first director of the Kaua'i Museum, she oversaw exhibits celebrating the history, culture, and art of Native Hawaiians.

Which choice completes the text so that it conforms to the conventions of Standard English?

A. finished though

B. finished. Though,

C. finished, though,

D. finished, though:

22 Mark for Review

Researchers studying bacteria have solved a 50-year mystery of how bacteria are able to move using appendages that are made of a single _____ the subunits of the protein can exist in 11 different shapes, allowing the appendages to "supercoil" into corkscrews that the bacteria use to propel themselves.

Which choice completes the text so that it conforms to the conventions of Standard English?

A. protein

B. protein while

C. protein,

D. protein:

23 Mark for Review

Fault tree analysis was originally used in engineering to enhance safety practices in high-risk fields, such as nuclear power and pharmaceuticals, but other fields are experimenting with ways to utilize this process to benefit their work. _____ fault tree analysis is also being used in low-risk fields, such as social services and software engineering.

Which choice completes the text with the most logical transition?

A. Increasingly,

B. Nevertheless,

C. Therefore,

D. In addition,

24 Mark for Review

When Monika Sosnowska began her career in Amsterdam as a painter, she never expected to branch out into other media. _____ she had primarily worked on canvas, but she quickly found her works evolving to include the three-dimensional space around her.

Which choice completes the text with the most logical transition?

A. Instead,

B. Consequently,

C. Previously,

D. Similarly,

25 Mark for Review

Fish sometimes appear in otherwise uninhabited bodies of water, seemingly emerging out of nowhere. Some scientists believe that the fish are carried to these locations in the beaks or talons of birds. _____ new research suggests that the fish eggs enter a state of hibernation and are actually eaten by birds and excreted out into the bodies of water.

Which choice completes the text with the most logical transition?

A. For instance,

B. Next,

C. Likewise,

D. Alternatively,

26 Mark for Review

While researching a topic, a student has taken the following notes:

- To restore oyster reefs in Australia, limestone boulders are submerged to provide habitats, but baby oysters need help finding the boulders.
- A team from University of Adelaide looked into using sound as a way to encourage the baby oysters to attach to the boulders.
- The research team recorded sounds at the healthy Port Noarlunga Reef to play near the submerged boulders.
- Boulders in the area with the soundscape attracted around 17,000 more oysters per square meter compared to boulders without the soundscape.
- Soundscapes can indicate a healthy place for baby oysters to grow and can be a cost-effective way to restore oyster reefs.

The student wants to emphasize the aim of the research study. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A. Researchers obtained a soundscape at Port Noarlunga Reef to help in the restoration of oyster reefs in Australia.

B. Researchers now know that the soundscape of a healthy marine ecosystem can attract baby oysters to attach to submerged limestone boulders.

C. After they measured the number of oysters attracted to boulders in the soundscape area compared to no soundscape, researchers determined that the soundscape attracted more baby oysters.

D. Researchers wanted to know whether a soundscape of a healthy marine ecosystem could encourage baby oysters to attach to submerged limestone boulders.

27 Mark for Review

While researching a topic, a student has taken the following notes:

- Neanderthals are an extinct species of humans who died out about 40,000 years ago and are the closest evolutionary relatives of present-day humans.
- Studying the genomes of Neanderthals provides insight into human evolution.
- Professor Svante Pääbo is a Swedish geneticist and the director of the Department of Genetics at the Max Planck Institute for Evolutionary Anthropology.

- His landmark study presented the first draft sequence of the Neanderthal genome.
- Laurits Skov of the Max Planck Institute for Evolutionary Anthropology has a doctorate in bioinformatics and studied evolutionary anthropology.
- One of his recent studies revealed the genomes of a family of Neanderthals.

The student wants to emphasize the affiliation and purpose of Pääbo's and Skov's work. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A. The closest evolutionary relatives of present-day humans, Neanderthals went extinct about 40,000 years ago.

B. By studying the genomes of Neanderthals, Svante Pääbo and Laurits Skov of the Max Planck Institute for Evolutionary Anthropology provide insight into human evolution.

C. Svante Pääbo and Laurits Skov study the genome of Neanderthals, an extinct species of humans.

D. Studies by Svante Pääbo and Laurits Skov reveal information about Neanderthals, who died out about 40,000 years ago.

S T O P

If you finish before time is called, you may check your work on this module only.
Do not turn to any other module in the test.

SAT Prep Test 4—Math
Module 1

DIRECTIONS

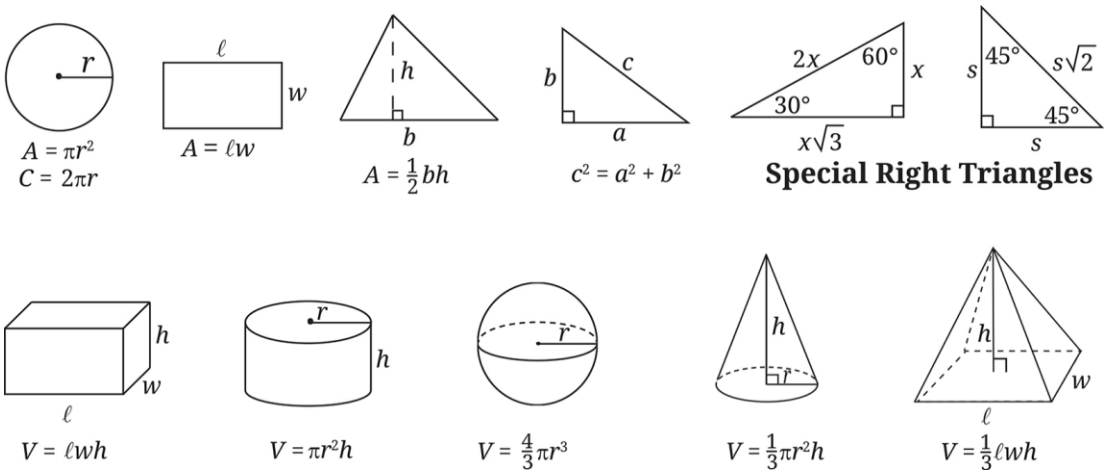
The questions in this section address a number of important math skills.
Use of a calculator is permitted for all questions.

NOTES

Unless otherwise indicated:

- All variables and expressions represent real numbers.
- Figures provided are drawn to scale.
- All figures lie in a plane.
- The domain of a given function *f* is the set of all real numbers *x* for which *f*(*x*) is a real number.

REFERENCE



The number of degrees of arc in a circle is 360.
The number of radians of arc in a circle is 2π.
The sum of the measures in degrees of the angles of a triangle is 180.

For multiple-choice questions, solve each problem, choose the correct answer from the choices provided, and then highlight your answer in this book. Highlight only one answer for each question. If you change your mind, completely erase the highlight. You will not get credit for questions with more than one answer highlighted or for questions with no answers highlighted.

For student-produced response questions, solve each problem and write your answer along with the question number on scratch paper as described below.

- Once you've written your answer, circle it clearly. You will not receive credit for anything written outside the circle or for any questions with more than one circled answer.
- If you find **more than one correct answer**, write and circle only one answer.
- Your answer can be up to 5 characters for a **positive** answer and up to 6 characters (including the negative sign) for a **negative** answer, but no more.
- If your answer is a **fraction** that is too long (over 5 characters for positive, 6 characters for negative), write the decimal equivalent.
- If your answer is a **decimal** that is too long (over 5 characters for positive, 6 characters for negative), truncate it or round at the fourth digit.
- If your answer is a **mixed number** (such as $3\frac{1}{2}$), write it as an improper fraction (7/2) or its decimal equivalent (3.5).
- Don't enter **symbols** such as a percent sign, comma, or dollar sign in your circled answer.

1 Mark for Review

A data set containing only the values 2, 2, 9, 9, 9, 16, 16, 16, 16, 26, 26, and 26 is represented by a frequency table. Which of the following is the correct representation of this data set?

A.

Number	Frequency
2	4
9	27
16	64
26	78

B.

Number	Frequency
2	2
9	3
16	4
26	3

C.

Number	Frequency
2	2
3	9
4	16
3	26

D.

Number	Frequency
4	2
27	9
64	16
78	26

2 Mark for Review

The expression $x^2 - x - 56$ is equivalent to which of the following expressions?

A. $(x - 14)(x + 4)$

B. $(x - 7)(x + 8)$

C. $(x - 8)(x + 7)$

D. $(x - 4)(x + 14)$

3 Mark for Review

A carpenter hammers 10 nails per minute and installs 7 screws per minute during a project. Which of the following equations represents the scenario if the carpenter hammers nails for x minutes, installs screws for y minutes, and uses a combined total of 200 nails and screws?

A. $\frac{1}{10}x + \frac{1}{7}y = 200$

B. $\frac{1}{10}x + \frac{1}{7}y = 3{,}420$

C. $10x + 7y = 200$

D. $10x + 7y = 3{,}420$

4 Mark for Review

What is the measure of angle F in the triangle DEF, where angle D is 73° and angle E is 35°?

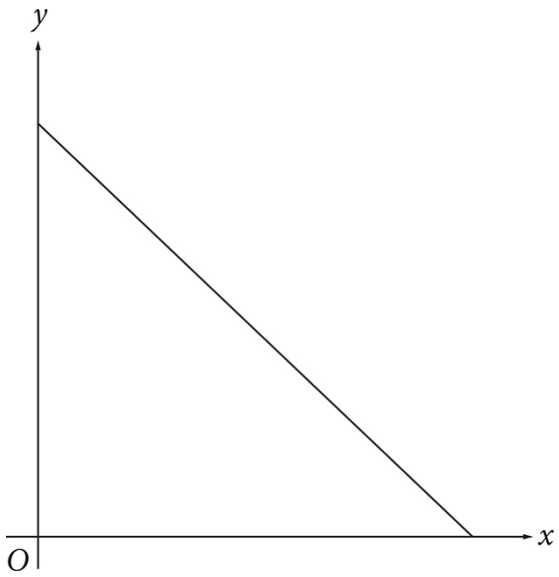
A. 38°

B. 72°

C. 108°

D. 126°

5 Mark for Review



The total amount of plastic remaining to be recycled in a facility over x shifts is represented by the graph shown. Which of the following is the best interpretation of the y-intercept of the graph?

A. The total amount of plastic remaining at any given time

B. The number of shifts it will take to finish recycling the plastic

C. The amount of plastic that is recycled per shift

D. The initial amount of plastic to be recycled

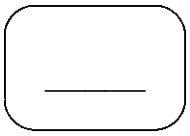
6 Mark for Review

The table shows the condition and subject type for 200 textbooks at a bookstore.

	Used	New	Total

Biology	10	30	40
Chemistry	25	25	50
Physics	30	10	40
Anatomy	15	55	70
Total	80	120	200

What is the probability that a textbook chosen at random will be a new textbook? (Express your answer as a decimal or fraction, not as a percent.)



7 Mark for Review

A random sample of 5,000 students out of 60,000 undergraduate students at a university were surveyed about a potential change to the registration system. According to the survey results, 75% of the respondents did not support the existing registration system, with a 4% margin of error. Which of the following represents a reasonable total number of students who did not support the existing registration system?

A. 1,250

B. 3,750

C. 13,800

D. 43,800

Go to Question 7 in Practice Test 2—Math Explanations, Module 1

8 Mark for Review

What is the negative solution to the equation $\frac{32}{a} = a - 4$?

9 Mark for Review

After a hot air balloon is launched from a plateau 1,000 meters above sea level, it rises at a constant rate of 750 meters per minute. Which of the following best describes the function used to model the balloon's distance above sea level over time?

A. Increasing linear

B. Increasing exponential

C. Decreasing linear

D. Decreasing exponential

10 Mark for Review

What is the x-intercept of the function $f(x) = (22)^x - 1$ when it is graphed in the xy-plane, where $y = f(x)$?

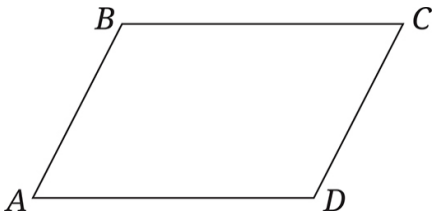
A. (–1, 0)

B. (0, 0)

C. (21, 0)

D. (22, 0)

11 Mark for Review



Note: Figure not drawn to scale.

In parallelogram $ABCD$ shown, the length of $\overline{AB}$ is one-third the length of $\overline{AD}$. The perimeter of the parallelogram is 64 inches. What is the length, in inches, of $\overline{AB}$?

A. 8

B. 16

C. 24

D. 32

12 Mark for Review

A triangle with an area of 18 square units has a base of $(m + 5)$ units and a height of m units. What is the value of m?

A. 4

B. 9

C. 13

D. 36

13 Mark for Review

Time (seconds)	Number of colonies of yeast
0	5
1	20
2	80
3	320

The table shows the exponential growth of a type of yeast over time s, in seconds. There are c total yeast colonies. What is the equation that represents this relationship, assuming that no yeast was added or removed after counting began?

A. $c = (1 + 3)^s$

B. $c = (1 + 5)^s$

C. $c = 3(1 + 5)^s$

D. $c = 5(1 + 3)^s$

14 Mark for Review

The equations $12x = y$ and $24x + 7 = 2y$ intersect at how many points when graphed in the xy-plane?

A. 0

B. 1

C. 2

D. 7

15 Mark for Review

Several tiles labeled with either an A or a B are placed in a bag, and tiles are worth a different point value depending on the label. The equation $15a + 10b = 100$ represents the situation when a of the A tiles and b of the B tiles are drawn from the bag for a total of 100 points. How many points would be earned by drawing one A tile and one B tile from the bag?

16 Mark for Review

The amount of money remaining in a scholarship fund is reduced by one-fourth every year. The amount of money in the fund is represented by d and the number of years by y. If the fund starts with $10,000, which of the following equations represents this situation after y years?

A. $d = \frac{1}{4}(10{,}000)^y$

B. $d = \frac{3}{4}(10{,}000)^y$

C. $d = 10{,}000\left(\frac{1}{4}\right)^y$

D. $d = 10{,}000\left(\frac{3}{4}\right)^y$

17 Mark for Review

What is the diameter, in millimeters (mm), of a cylinder with a volume of 144π mm^3 and a height of 4 mm?

A. 6

B. 9

C. 12

D. 36

18 Mark for Review

$$4x + 2y = 4$$
$$19x + 10y = 14$$

When graphed in the *xy*-plane, the linear equations shown above intersect at (*a, b*). What is the value of *a*?

A. –20

B. –10

C. 6

D. 14

19 Mark for Review

The longest side of right triangle *ABC* is opposite angle *B*. If $\sin(A) = \frac{9}{41}$, what is the value of $\sin(C)$?

_____

GO TO QUESTION 19 IN PRACTICE TEST 2—MATH EXPLANATIONS, MODULE 1

20 Mark for Review

Function g reaches its maximum value when $x = a$. If $g(x) = -6x^2 - 30x - 24$, what is the value of a?

21 Mark for Review

$$f(x) = -\frac{1}{5}x - 3$$

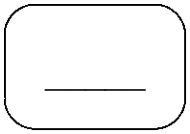
The linear function $f(x)$, defined by the given equation, is perpendicular to linear function $g(x)$ when graphed in the xy-plane. If $g(0) = 0$, what is the value of $g(2)$?

22 Mark for Review

$$y = 5kx^2 + 2x + 3$$

$$\frac{y}{10} = -x$$

The given system of equations has exactly one solution. If k is a positive constant, what is the value of k?



YIELD

Once you've finished (or run out of time for) this section, use the answer key to determine how many questions you got right. If you got fewer than 14 questions right, move on to Module 2—Easier, otherwise move on to Module 2—Harder.

SAT Prep Test 4—Math

Module 2—Easier

Turn to Section 2 of your answer sheet (this page) to answer the questions in this section.

DIRECTIONS

The questions in this section address a number of important math skills.

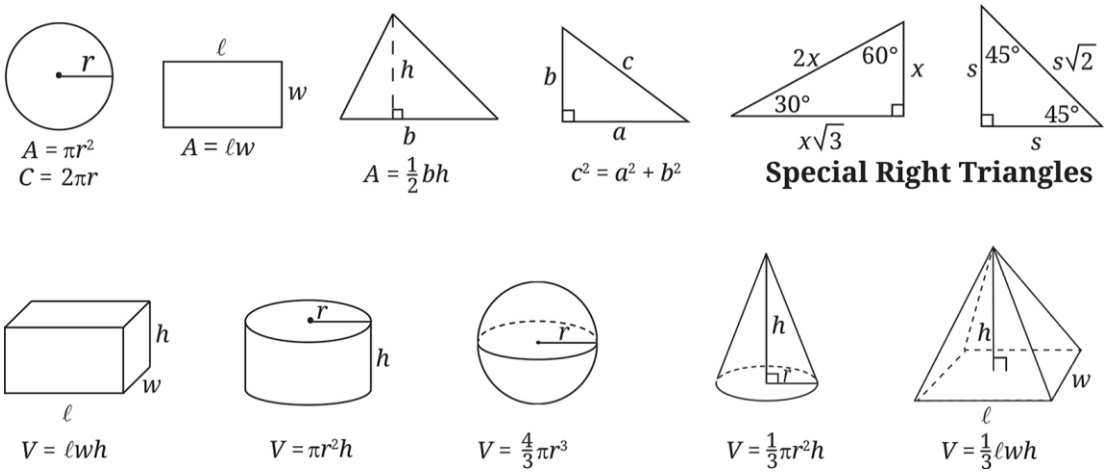
Use of a calculator is permitted for all questions.

NOTES

Unless otherwise indicated:

- All variables and expressions represent real numbers.
- Figures provided are drawn to scale.
- All figures lie in a plane.
- The domain of a given function *f* is the set of all real numbers *x* for which *f*(*x*) is a real number.

REFERENCE



The number of degrees of arc in a circle is 360.
The number of radians of arc in a circle is 2π.
The sum of the measures in degrees of the angles of a triangle is 180.

For multiple-choice questions, solve each problem, choose the correct answer from the choices provided, and then highlight your answer in this book. Highlight only one answer for each question. If you change your mind, completely erase the highlight. You will not get credit for questions with more than one answer highlighted or for questions with no answers highlighted.

For student-produced response questions, solve each problem and write your answer along with the question number on scratch paper as described below.

- Once you've written your answer, circle it clearly. You will not receive credit for anything written outside the circle or for any questions with more than one circled answer.
- If you find **more than one correct answer**, write and circle only one answer.
- Your answer can be up to 5 characters for a **positive** answer and up to 6 characters (including the negative sign) for a **negative** answer, but no more.
- If your answer is a **fraction** that is too long (over 5 characters for positive, 6 characters for negative), write the decimal equivalent.
- If your answer is a **decimal** that is too long (over 5 characters for positive, 6 characters for negative), truncate it or round at the fourth digit.
- If your answer is a **mixed number** (such as $3\frac{1}{2}$), write it as an improper fraction (7/2) or its decimal equivalent (3.5).
- Don't enter **symbols** such as a percent sign, comma, or dollar sign in your circled answer.

1 Mark for Review

33, 34, 38, 41, 43, 44, 47

Which of the following is the median of the given data?

A. 38

B. 40

C. 41

D. 42

2 Mark for Review

What is the value of the solution to the equation $22 = y - 10$?

3 Mark for Review

A rectangle has a height of 23 inches (in) and a width of 9 in. What is its perimeter, in inches?

A. 32

B. 64

C. 207

D. 1,024

4 Mark for Review

$15a - (6a - 2a)$

Which of the following expressions is equivalent to the given expression?

A. $5a$

B. $7a$

C. $11a$

D. $23a$

5 Mark for Review

Which equation represents the relationship between the numbers a and b if a is half of b?

A. $a = \frac{1}{2}b$

B. $a = b - 2$

C. $a = b + 2$

D. $b = \frac{1}{2}a$

6 Mark for Review

For all positive values of y, the expression $\frac{3}{y + c}$ is equivalent to $\frac{15}{5y + 30}$.

What is the value of constant c?

A. 3

B. 6

C. 8

D. 150

7 Mark for Review

A total of 200 pets were adopted at an event. If 70% of the adopted pets were dogs, how many of the pets were dogs?

_____

8 Mark for Review

James must drive 100 miles before he can take his driver's license test. He knows that when he drives around town running errands, he drives at an average speed of 20 miles per hour. If James maintains this average speed, how many hours must he drive to meet the requirement for his driver's license test?

A. 5

B. 20

C. 80

D. 100

9 Mark for Review

What is the value of $4y - 16$ if $y - 4 = 11$?

10 Mark for Review

The function g is defined as $g(x) = x^2 - 1$. What is the value of $g(x)$ when $x = 3$?

A. 4

B. 5

C. 7

D. 8

11 Mark for Review

The production cost $p(x)$, in dollars, to produce x units of an item when materials cost \$2 per item is given by $p(x) = 2x + 150$. What is the total cost to produce 2,000 units of this item?

A. \$1,850

B. \$2,300

C. \$3,850

D. \$4,150

12 Mark for Review

The function f is given as $f(x) = \frac{2}{3}x$. When $x = 6$, what is the value of $f(x)$?

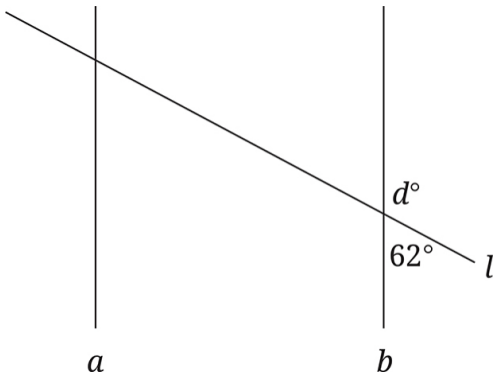
A. 2

B. 4

C. 6

D. 9

13 Mark for Review



Note: Figure not drawn to scale.

In the given figure, what is the value of d if line a is parallel to line b?

14 Mark for Review

$3x - 4y = 17$

In the xy-plane, the graph of a line with an x-intercept of $(c, 0)$ and a y-intercept of $(0, k)$, where c and k are constants, can be represented by the given equation. What is the value of $\frac{c}{k}$?

A. $-\frac{4}{3}$

B. $-\frac{3}{4}$

C. $\frac{3}{4}$

D. $\frac{4}{3}$

15 Mark for Review

A postal machine processes mail at a constant rate of 21 pieces of mail per minute. At this rate, how many pieces of mail would the machine process in 7 minutes?

A. 3

B. 14

C. 28

D. 147

16 Mark for Review

Stella had 211 invitations to send for an event. She has already sent 43 invitations and will send them all if she sends 24 each day for the next d days. Which of the following equations represents this situation?

A. $24d - 43 = 211$

B. $24d + 43 = 211$

C. $43d - 24 = 211$

D. $43d + 24 = 211$

17 Mark for Review

x	$f(x)$
–1	12
0	15
1	18
2	21

When the linear function $y = f(x)$ is graphed in the xy-plane, the graph contains the corresponding values of x and $f(x)$ shown in the table. Which of the following could represent function f?

A. $f(x) = 3x + 12$

B. $f(x) = 3x + 15$

C. $f(x) = 15x + 12$

D. $f(x) = 15x + 15$

18 Mark for Review

The height of a rocket launched from a rooftop can be modeled by the equation $h = -16s^2 + 64s + 21$, where h is the height of the rocket above the ground, in feet, and s is the number of seconds since the rocket was launched. Which of the following represents the height, in feet, of the rooftop from which the rocket was launched?

A. 0

B. 16

C. 21

D. 64

19 Mark for Review

Function f is defined by $f(x) = x^3 + 1$. Which of the following tables gives three values of x and their corresponding values of y?

A.

x	2	3	4
y	3	4	5

B.

x	2	3	4
y	3	28	64

C.

x	2	3	4
y	9	10	65

D.

x	2	3	4
y	9	28	65

20 Mark for Review

If $h(-1) = 3$ and $h(0) = 5$ in linear function h, which of the following is the equation of function h?

A. $h(x) = 2x + 5$

B. $h(x) = 2x + 3$

C. $h(x) = 2x$

D. $h(x) = 3x + 5$

21 Mark for Review

Which of the following equations correctly expresses r in terms of p and s if the relationship between the numbers p, r, and s can be expressed as $p = 13r - 6s$?

A. $r = \frac{-6s - p}{13}$

B. $r = 13p + 6s$

C. $r = \frac{1}{13}p + 6s$

D. $r = \frac{p + 6s}{13}$

22 Mark for Review

Right triangle ABC has sides of the following lengths: $AB = 165$, $BC = 280$, and $AC = 325$. Another triangle, LMN, is similar to ABC such that A corresponds to L and B corresponds to M. What is the value of $\cos(L)$?

A. $\frac{33}{65}$

B. $\frac{33}{56}$

C. $\frac{56}{65}$

D. $\frac{65}{33}$

S T O P

If you finish before time is called, you may check your work on this module only.

Do not turn to any other module in the test.

SAT Prep Test 4—Math

Module 2—Harder

Turn to Section 2 of your answer sheet (this page) to answer the questions in this section.

DIRECTIONS

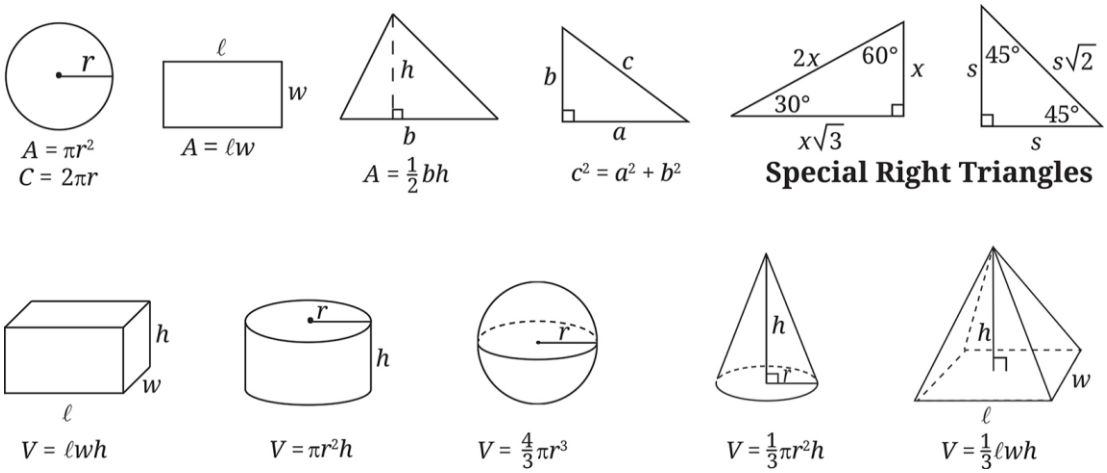
The questions in this section address a number of important math skills.
Use of a calculator is permitted for all questions.

NOTES

Unless otherwise indicated:

- All variables and expressions represent real numbers.
- Figures provided are drawn to scale.
- All figures lie in a plane.
- The domain of a given function *f* is the set of all real numbers *x* for which *f*(*x*) is a real number.

REFERENCE



The number of degrees of arc in a circle is 360.
The number of radians of arc in a circle is 2π.
The sum of the measures in degrees of the angles of a triangle is 180.

For multiple-choice questions, solve each problem, choose the correct answer from the choices provided, and then highlight your answer in this book. Highlight only one answer for each question. If you change your mind, completely erase the highlight. You will not get credit for questions with more than one answer highlighted or for questions with no answers highlighted.

For student-produced response questions, solve each problem and write your answer along with the question number on scratch paper as described below.

- Once you've written your answer, circle it clearly. You will not receive credit for anything written outside the circle or for any questions with more than one circled answer.
- If you find **more than one correct answer**, write and circle only one answer.
- Your answer can be up to 5 characters for a **positive** answer and up to 6 characters (including the negative sign) for a **negative** answer, but no more.
- If your answer is a **fraction** that is too long (over 5 characters for positive, 6 characters for negative), write the decimal equivalent.
- If your answer is a **decimal** that is too long (over 5 characters for positive, 6 characters for negative), truncate it or round at the fourth digit.
- If your answer is a **mixed number** (such as $3\frac{1}{2}$), write it as an improper fraction (7/2) or its decimal equivalent (3.5).
- Don't enter **symbols** such as a percent sign, comma, or dollar sign in your circled answer.

1 Mark for Review

Which of the following is equivalent to $3a^3 - 5a^3 + 6a$?

A. $-2a^3 + 6a$

B. $3a^3 + a$

C. $4a$

D. $-15a^9 + 6a$

2 Mark for Review

In a shipment of 45,000,000 shirts, 4,950,000 are white. What percent of the shirts are white shirts?

A. 11%

B. 22%

C. 78%

D. 89%

3 Mark for Review

If $3(x - 8) - 16 = 8(x + 10) + x$, what is the value of $6x$?

4 Mark for Review

$$8(a - 3) - 17 = 9(a - 3)$$

In the given equation, what is the value of $a - 3$?

A. –20

B. –17

C. –14

D. 3

5 Mark for Review

A school classroom with a total of 4,200 floor tiles is divided into a 30 square-foot lab area and an 80 square-foot seating area. The number of tiles on the entire classroom floor can be represented by the equation $30a + 80b = 4{,}200$. In this context, which of the following does b represent?

A. The average number of tiles per square foot in the lab area

B. The total number of tiles in the lab area

C. The average number of tiles per square foot in the seating area

D. The total number of tiles in the seating area

6 Mark for Review

A triangle has a base that is 65% of its height. If the base were decreased by 13 inches, how would the height need to change to keep the same proportions?

A. It must increase by 13 inches.

B. It must increase by 20 inches.

C. It must decrease by 13 inches.

D. It must decrease by 20 inches.

7 Mark for Review

If $\frac{a}{3} = 10 - 7b$ and $a \neq 0$, which of the following correctly expresses b in terms of a?

A. $b = \frac{a-21}{30}$

B. $b = \frac{30 - a}{21}$

C. $b = 10 + \frac{a}{3}$

D. $b = 10 + \frac{3}{a}$

8 Mark for Review

For all positive values of y, the expression $\frac{3}{y + c}$ is equivalent to $\frac{15}{5y + 30}$.

What is the value of constant c?

A. 3

B. 6

C. 8

D. 150

9 Mark for Review

In the xy-plane, the equation $(x - 7)^2 + (y + 7)^2 = 64$ defines circle O, and the equation $(x - 7)^2 + (y + 7)^2 = c$ defines circle P. If the two circles have the same center, and the radius of circle P is three less than the radius of circle O, what is the value of constant c?

10 Mark for Review

A school has received a donation of $20,000 for the purchase of new laptops. If each laptop costs $149, no tax is charged, and the laptop manufacturer offers a 7.5% discount on orders of at least 100 laptops, what is the maximum number of laptops the school can purchase with the donation?

A. 124

B. 134

C. 145

D. 146

11 Mark for Review

$$3x^2 - y - 26 = 0$$
$$y = -3x + 10$$

The point (a, b) is an intersection of the given system of equations when graphed in the xy-plane. What is a possible value of a?

A. –4

B. 6

C. 20

D. 26

12 Mark for Review

How many values for x satisfy the equation $-6(4x + 2) = 3(4 - 8x)$?

A. Zero

B. Exactly one

C. Exactly two

D. Infinitely many

13 Mark for Review

A parabola represents the graph of the function f in the xy-plane, where $y = f(x)$. If the vertex of the parabola is $(5, -4)$ and one of the x-intercepts is $(-1.5, 0)$, what is the other x-intercept?

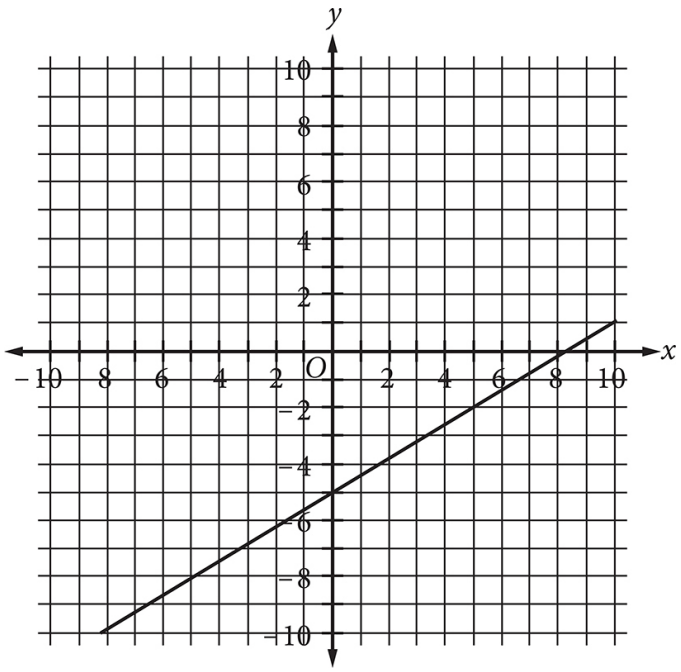
A. $(-6.5, 0)$

B. $(1.5, 0)$

C. (3.5, 0)

D. (11.5, 0)

14 Mark for Review



Which equation defines function g, if the graph of $y = g(x) - 10$ is shown?

A. $y = \frac{5}{8}x - 15$

B. $y = \frac{5}{8}x - 5$

C. $y = \frac{5}{8}x + 5$

D. $y = \frac{5}{8}x + 10$

15 Mark for Review

If c is a constant in the equation $10x^2 + c = -5x$, and the equation has no real solutions, what is the value of c?

A. –20

B. –5

C. 0

D. 1

16 Mark for Review

$$3x - 4y = 17$$

In the xy-plane, the graph of a line with an x-intercept of $(c, 0)$ and a y-intercept of $(0, k)$, where c and k are constants, can be represented by the given equation. What is the value of $\frac{c}{k}$?

A. $-\frac{4}{3}$

B. $-\frac{3}{4}$

C. $\frac{3}{4}$

D. $\frac{4}{3}$

17 Mark for Review

$$-7 + 2f = cg$$
$$21g + 21 = 6f - 15g$$

If c is a constant, and the given system of equations has infinitely many solutions, what is the value of c?

18 Mark for Review

Triangle A has angles measuring 30º, 60º, and 90º. What is the perimeter, in centimeters, of this triangle if the smallest side has a length of 15 centimeters?

A. $15\sqrt{3}$

B. $15 + 15\sqrt{3}$

C. $45 + 15\sqrt{3}$

D. $45\sqrt{3}$

19 Mark for Review

x	$g(x)$
2	46
4	0
6	–46
8	–92

The table shows values of x and their corresponding values of $g(x)$ for the linear function g. The equation $g(x) = cx + d$ defines function g, and c and d are constants. What is the value of $c + d$?

A. –23

B. 69

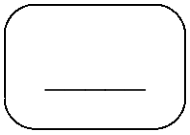
C. 92

D. 115

20 Mark for Review

114, 109, 106, 111

A data set consists of 5 positive integers greater than 101. What is the value of the smallest integer in the data set if the mean of the entire data set is an integer that is less than the mean of the four integers from the data set shown?



21 Mark for Review

A teacher awards points to a class based on completed assignments. He gives 5 points per assignment for the first 50 completed assignments and 3 points for each additional completed assignment beyond 50. When $a \geq 50$, which function g gives the total number of points earned by the class for a completed assignments?

A. $g(a) = 3a + 5$

B. $g(a) = 3a + 100$

C. $g(a) = 3a + 250$

D. $g(a) = 8a - 150$

22 Mark for Review

In triangles ABC and XYZ, $AB = 22$, $XY = 11$, and angles A and X both measure 77°. Which of the following pieces of information, if any, would

be enough to prove that the two triangles are similar to each other?

. Angle B measures 40° . Angle Y measures 50° . Angle Z measures 63°

A. No additional information is necessary.

B. Angle measures alone do not provide enough information.

C. I and II together provide enough information.

D. I and III together provide enough information.

S T O P

If you finish before time is called, you may check your work on this module only.
Do not turn to any other module in the test.

Practice Test 4: Answers and Explanations

Reading and Writing

Module 1

1. D
2. B
3. B
4. A
5. D
6. A
7. A
8. A
9. A
10. B
11. A
12. B
13. D
14. A
15. C
16. C
17. D
18. A
19. A
20. B
21. B
22. C
23. D
24. D
25. C
26. D
27. C

Module 2 (Easier)

1. D
2. A
3. C
4. A
5. B
6. B
7. A
8. A
9. C
10. D
11. D
12. C
13. C
14. B
15. A
16. A
17. D
18. B
19. D
20. D
21. A
22. D
23. C
24. D
25. C
26. A
27. A

Module 2 (Harder)

1. C

2. B
3. C
4. D
5. A
6. C
7. A
8. D
9. A
10. B
11. B
12. A
13. A
14. A
15. C
16. A
17. C
18. B
19. A
20. A
21. D
22. D
23. A
24. C
25. D
26. D
27. B

Math

Module 1

1. B
2. C

3. C
4. B
5. D
6. $\frac{12}{20}$ or .6
7. D
8. -4
9. A
10. B
11. A
12. A
13. D
14. A
15. 25
16. D
17. C
18. C
19. $\frac{40}{41}$ or .9756
20. -2.5
21. 10
22. 2.4

Module 2 (Easier)

1. C
2. 32
3. B
4. C
5. A
6. B
7. 140
8. A
9. 44

10. D
11. D
12. B
13. 118
14. A
15. D
16. B
17. B
18. C
19. D
20. A
21. D
22. A

Module 2 (Harder)

1. A
2. A
3. -120
4. B
5. C
6. D
7. B
8. B
9. 25
10. C
11. A
12. A
13. D
14. C
15. D
16. A
17. 12

18. C
19. B
20. 105
21. B
22. D

PRACTICE TEST 2—READING AND WRITING EXPLANATIONS

Module 1

1. **D**

   This is a Vocabulary question, as it's asking for a *logical and precise word or phrase.* Read the passage and highlight what can help fill in the blank. The passage states that *the risk of loss of human life in the event of an eruption is minimal,* so the area surrounding Calabozos must not be very inhabited. A good word for the annotation box based on this information would be "isolated."

   - (A) and (B) are wrong because *hazardous* and *active* don't match "isolated."
   - (C) is wrong because *mountainous* is a **Beyond the Text trap**: mountainous regions are often isolated, but the passage does not support that the area surrounding Calabozos has any other mountains besides the volcano itself.
   - (D) is correct because *remote* matches "isolated."

2. **B**

   This is a Vocabulary question, as it's asking for a *logical and precise word or phrase.* Read the passage and highlight what can help fill in the blank. The passage states that H.D. *wrote in a variety of forms and genres,* yet her contemporaries *focused only on her important contributions to the Imagist movement.* Therefore, a good phrase for the annotation box based on this information would be that the contemporaries' view was "narrow."

- (A) is wrong because *expansive* is the **Opposite** of "narrow."
- (B) is correct because *limited* matches "narrow."
- (C) and (D) are wrong because *imaginative* and *complicated* don't match "narrow."

3. **B**

This is a Purpose question, as it's asking for the *function* of a sentence. Read the passage and highlight what can help understand the function of the second sentence. In the second sentence, *Previous studies…have been unsuccessful because these studies relied on human subjects.* In the third sentence, it states that *A recent study by physiologists Yuta Senzai and Massimo Scanziani has avoided this issue by studying dreaming mice instead.* Therefore, the second sentence must be describing an issue that the scientists in the third sentence avoided. Write "explain issue with previous studies" in the annotation box.

- (A) is wrong because it is the **Opposite** of what the passage supports: *previous studies* ran into a *problem,* but the study by *Yuta Senzai and Massimo Scanziani has avoided this issue.*
- (B) is correct because it's consistent with the relationship between the second and third sentences.
- (C) is wrong because it is **Half-Right:** the sentence mentions the studies before Senzai and Scanziani's but does not *present the findings* of those studies.
- (D) is wrong because the passage does not discuss anyone interpreting Senzai and Scanziani's study.

4. **A**

This is a Purpose question, as it's asking for the *function* of a sentence. Read the passage and highlight what can help understand the function of the third sentence. In the third sentence, it states that *electroreception is not limited to fish.* Write "explain it's not just fish" in the annotation box.

- (A) is correct because it's consistent with the highlighting and annotation.
- (B) is wrong because it's **Half-Right:** the fourth sentence explains how monotremes use electroreception, but the earlier sentences do not explain how fish use electroreception, just that they have it.
- (C) is wrong because it is **Right Answer, Wrong Question:** the fourth and possibly the fifth sentence give more *examples* of animals with electroreception, not the third sentence, which is what the question asks about.
- (D) is wrong because the passage does not explain *how electroreception evolved* in any of the animals discussed.

5. **D**

This is a Dual Texts question, as it asks how the scientists in Text 2 would *most likely respond* to those in Text 1. Read Text 1 and highlight the claim made by Premack and Woodruff regarding a theory of mind: after seeing videos of human actors struggling with various problems, *the chimpanzees were able to select photographs that showed the best tool to solve each actor's problem.* Read Text 2 and highlight Povinelli, Nelson, and Boysen's response to the same idea: *it may be the case that chimpanzees are following learned behaviors in a known environment,*

rather than applying a theory of mind in a novel situation. Write in the annotation box for the highlighting in Text 2 that "Text 2 offers an alternate explanation."

- (A) and (C) are wrong because neither passage discusses any other *nonhuman primates* besides chimpanzees.

- (B) is wrong because it is **Recycled Language:** it's the human subjects in Text 1 that are described as *struggling* with a problem and Text 2 never suggests that the chimpanzees could solve problems by struggling through the problems on their own.

- (D) is correct because it would address the scientists in Text 2's main objection to the claim in Text 1: by placing the chimpanzees *in novel environments* that they *would have been unlikely to encounter* previously, Premack and Woodruff could better determine whether the chimpanzees have a theory of mind rather than are just *following learned behaviors in a known environment.*

6. **A**

This is a Retrieval question, as it says *According to the text.* Read the passage and highlight what is said about Dorian. The passage mentions that *his cheeks flushed for a moment with pleasure* and *A look of joy came into his eyes* upon seeing his picture. He knows that *Hallward was speaking to him, but* he was *not catching the meaning of his words.* Lastly, *The sense of his own beauty came on him like a revelation.* The correct answer should be consistent with as many of these ideas as possible.

- (A) is correct because it exactly describes what is occurring in the passage. Dorian cannot focus on what Hallward is saying because of the beauty of his own picture.

- (B) is wrong because it is **Extreme Language:** Dorian can't focus on what Hallward is saying, but the passage never goes so far as to state that Dorian thinks it's *unimportant.*

- (C) is wrong because it is the **Opposite** of the passage: not only does Dorian *recognize his own image,* but he is also immensely pleased by it.

- (D) is wrong because nothing about how easily Dorian gets embarrassed is mentioned in the passage.

7. **A**

This is a Retrieval question, as it says *Based on the text.* Read the passage and highlight what is said about the children. The passage states that the old forester wondered *What would become of them* (the children)*—living in so sequestered a spot that few even knew of its existence—totally shut out from the world, and left to their own resources?* The correct answer should be as consistent with this description of the children as possible.

- (A) is correct because *isolated from people other than the old forester* is consistent with *totally shut out from the world.*

- (B) is wrong because it is **Extreme Language:** while the forester is worried about what would happen to the children if left alone, the passage does not indicate that the children would be *completely unable* to take care of themselves.

- (C) is wrong because it is the **Opposite** of the forester's feelings toward the children: he feels responsible for them, not *resentful* of them.

- (D) is wrong because it is **Recycled Language:** the answer misuses the word *responsibility* from the passage and never indicates that the children help the forester with his tasks.

8. **A**

This is a Main Idea question, as it asks for the *main idea* of the text. Read the passage and highlight the main phrases or lines that all of the other sentences seem to support. The citation states that the author is addressing an unknown person. The opening two lines state that the author will never *hold a place* in this person's (*thine*) heart until the author renounces *all sense, all shame, all grace.* The author also states at the end of the poem that this individual will make an *offer with corrupting art / The rotten borough of the human heart.* The main idea would be that author's feelings toward this individual in this poem are negative, and the correct answer should be consistent with this.

- (A) is correct because it is consistent with the main idea and *disapproval toward the unknown person* is expressed several times in the poem.

- (B) and (D) are wrong because the poem never states what the unknown person feels toward the author, just what the author feels toward the unknown person. Choice (D) is also **Recycled Language** and warps the meaning of the opening line of the passage.

- (C) is wrong because it is **Recycled Language:** the author is not referring to a literal seat. Rather, the seat is a metaphor for the place the speaker may hold in the unknown person's heart.

9. **A**

This is a Claims question, as it asks for what answer would support Soni and his team's claim. Read the passage and highlight the claim made by Soni's team, which is that *administering ketone esters can reduce inflammation and immune system weakening caused by sepsis.*

- (A) is correct because it shows *ketone esters* to be more effective at reducing inflammation and reducing damage to organs (which the passage states are connected to immune system response) than at least one other treatment, *standard antibiotics*.

- (B) is wrong because it does not address the items mentioned in the claim, referencing *blood ketone levels* and *energy* rather than *inflammation* and the *immune system* or *organ damage.*

- (C) is wrong because the passage does not mention *medication intended to reduce fever* or how such medication would affect the performance of *ketone esters.*

- (D) is wrong because it is **Half-Right:** patients treated with *ketone esters* should have *reduced inflammation*, but they should have *less* organ damage, not *greater* organ damage, than those treated with other treatments, such as standard antibiotics.

10. **B**

This is a Charts question as it asks about *data from the table* that will complete an example. Read the table first and note the title and terms on the table. Then, read the passage and look for a claim and example that mentions those same terms. The fourth sentence states that *horses with only one handler were less reluctant to interact with the novel object than were horses with multiple handlers.* The example states that

45% of horses with only one handler had no reluctance when interacting with a novel object, so a good completion of this example would compare that statistic to a statistic regarding *multiple handlers* while remaining consistent with the claim in the fourth sentence.

- (A) and (D) are wrong because they don't mention *multiple handlers,* which are needed to be consistent with the passage's claim.

- (B) is correct because it shows that horses with *multiple handlers* only had *no reluctance* toward interacting with the novel object 25% of the time, whereas horses with only one handler showed no reluctance 45% of the time, making them less reluctant overall as the claim states.

- (C) is wrong because the claim and the first half of the example address no reluctance rather than strong reluctance. It's best to compare two items from the same row or same column to complete comparisons, depending on what the problem is looking for.

11. **A**

This is a Charts question as it asks about *data from the table* that will illustrate a claim. Read the table first and note the title and variables. Then, read the passage and look for a claim that mentions those same terms. The fourth sentence states that *starting with the 1989 election, the party which won the largest number of seats failed to win more than half of the total seats.* The final sentence claims that *This trend was eventually broken by the Bharatiya Janata Party.* The correct answer should offer evidence from the table that supports the Bharatiya Janata Party breaking the trend described in the fourth sentence.

- (A) is correct because it is consistent with the table for those years and shows the Bharatiya Janata Party holding both the largest number of seats *and* a majority of the total seats.

- (B), (C), and (D) are wrong because none of them mention the Bharatiya Janata Party winning a majority, or *more than half of the total seats,* as stated in the passage.

12. **B**

This is a Charts question as it asks about *data from the table* that will support a hypothesis. Read the table first and note the title and terms. Then, read the passage and look for a hypothesis that mentions those same terms. The last sentence states that *A group of researchers… hypothesized that those who take vitamin B12 would experience improvements in fibrosis and insulin resistance when compared to a control group over the same time period.* The correct answer should use data from the table to support this idea.

- (A) is wrong because it only talks about the control group and not the Vitamin B12 group.

- (B) is correct because it references both groups and is consistent with the relationship between those groups stated by the claim in the passage.

- (C) and (D) are wrong because neither mentions the terms *fibrosis* and *insulin resistance* that were referenced by the claim.

13. **D**

This is a Charts question as it asks about *data from the table* that will complete a statement. Read the table first and note the title and terms. Then, read the passage and look for a statement that mentions those same terms. The last sentence states that *The localized nature of weather patterns during this event can be seen by comparing Newark, NJ, and New York, NY, with* _____. The correct answer should complete this statement regarding localized weather patterns by showing a difference in mean levels of carbon monoxide in Newark and New York when compared to a more distant city.

- (A), (B), and (C) are wrong because the mean levels of carbon monoxide shown for Washington, D.C., and Philadelphia, PA, on the dates in each answer are similar or identical to the levels in New York, NY, on those dates. Farther cities from Newark showing similar levels to neighboring cities to Newark would not show the *localized nature of weather patterns during* the smog event.

- (D) is correct because Washington, D.C., shows zero carbon monoxide recorded on those dates, while Newark and New York show positive carbon monoxide level.

14. **A**

This is a Conclusions question as it asks for an answer that *logically completes the text*. Read the passage and highlight the main ideas. The passage states that *neurons change how they respond to stimuli based on previous experience* and that *electrical engineers seek to replicate similar processes in their development of computer memory.* Lastly, *electrical engineer Mohammad Samizadeh Nikoo has demonstrated that vanadium dioxide* (VO_2) *has a similar memory property to that of neurons.* The correct answer should be consistent with these ideas and establish a logical link between them.

- (A) is correct because it establishes a link between VO_2 from the last sentence and the computer memory that electrical engineers are trying to work on from the second sentence.

- (B) and (C) are wrong because both are **Recycled Language.** For (B), it's never stated that neurons use VO_2 in any way, just that they have a similar memory property. Choice (C) takes the words *neurons,* VO_2, and *stimuli from sensory organs* and combines them in a way not supported by the passage.

- (D) is wrong because it uses **Extreme and Recycled Language:** it is VO_2, not neurons, that may be helpful for computer memory. Furthermore, the passage supports this as only a possibility, whereas the answer states that the engineers *can now use* it.

15. **C**

In this Rules question, pronouns are changing in the answer choices, so it's testing consistency with pronouns. Find and highlight the word the pronoun refers back to, *books*, which is plural, so a plural pronoun is needed. Write an annotation saying "plural." Eliminate any answer that isn't consistent with *books.*

- (A) is wrong because *some* doesn't refer back to a specific thing.

- (B) and (D) are wrong because they are singular.

- (C) is correct because *they* is plural and is consistent with *books*.

16. **C**

In this Rules question, commas and the word *that* are changing in the answers, which suggests that the question is testing the construction of describing phrases. The first part of the sentence says *In 1988, the group worked together to form Action Deaf Youth,* which is an independent clause followed by a comma. Eliminate any answer that isn't consistent with the first part of the sentence.

- (A) is wrong because a phrase starting with "that" is Specifying and never follows a comma.
- (B) and (D) are wrong because they both create a run-on sentence.
- (C) is correct because it creates a Specifying phrase with *that* and no punctuation.

17. **D**

In this Rules question, verb forms are changing in the answer choices, so it's testing sentence structure. If the main verb is in the wrong form, the sentence won't be complete. The subject of the sentence is *Her experience*, but there is no main verb, so one is needed. Eliminate any answer that does not produce a complete sentence.

- (A) is wrong because a "to" verb can't be the main verb in a sentence.
- (B) is wrong because it lacks a main verb and thus creates an incomplete sentence.
- (C) is wrong because an -*ing* verb can't be the main verb in a sentence.

- (D) is correct because *inspired* is in the right form to be the main verb and make a complete sentence.

18. **A**

In this Rules question, punctuation is changing in the answer choices, so look for independent clauses. The first part of the sentence says *American artist Simone Leigh creates art in various mediums, including sculptures, video, and performance*, which is an independent clause. The second part says *discussing the themes and images in her artwork, Leigh has emphasized that Black women are her primary audience…*, which is also an independent clause. Eliminate any answer that can't correctly connect two independent clauses.

- (A) is correct because a period is appropriately used after an independent clause.
- (B) is wrong because it creates a run-on sentence.
- (C) and (D) are wrong because neither a coordinating conjunction by itself nor a comma by itself can connect two independent clauses.

19. **A**

In this Rules question, pronouns are changing in the answer choices, so it's testing consistency with pronouns. Find and highlight the word the pronoun refers back to, *wet-folding*, which is singular, so a singular pronoun is needed. Write an annotation saying "singular." Eliminate any answer that isn't consistent with *wet-folding*.

- (A) is correct because *It* is singular and is consistent with *wet-folding*.
- (B) and (D) are wrong because they are plural.
- (C) is wrong because *One* doesn't refer back to a specific thing.

20. **B**

In this Rules question, punctuation is changing in the answer choices. Look for independent clauses. The first part of the sentence says *His 2004 installation The Glassy Surface of a Lake*. The verb (*uses*) comes right after this. A single punctuation mark can't separate a subject and a verb, so eliminate answers with punctuation.

- (A), (C), and (D) are wrong because a single punctuation mark can't come between a subject and a verb.
- (B) is correct because no punctuation should be used here.

21. **B**

In this Rules question, punctuation with a transition is changing in the answer choices. The first part of the sentence says *Not all of the styles survived beyond that time*. There is an option to add *however* to this independent clause, and since it is contrasting with the previous idea, eliminate options that don't include *however* in the first part or are incorrectly punctuated.

- (A) is wrong because it doesn't put *however* with the first independent clause.

- (B) is correct because *however* is part of the first independent clause.

- (C) and (D) are wrong because a comma can't be used to connect two independent clauses.

22. **C**

This is a Transitions question, so follow the basic approach. Highlight ideas that relate to each other. The previous sentence says *Calede first compared measurements of the beaver's ankle*, and the next sentence says *Calede dated the species to approximately 30 million years ago*. These ideas are different steps Calede took, so a same-direction transition is needed. Make an annotation that says "agree." Eliminate any answer that doesn't match.

- (A) is wrong because *For example* introduces an example not stated in the passage.

- (B) is wrong because *In conclusion* introduces a conclusion not present in the passage.

- (C) is correct because *Next* introduces another step in a sequence.

- (D) is wrong because *In fact* is used to give more detail, which is not present.

23. **D**

This is a Transitions question, so follow the basic approach. Highlight ideas that relate to each other. The previous part of the paragraph says *Male and female American citizens had starkly different roles during*

World War II and lists the roles of men, and the sentence in question says *women were responsible for maintaining the home and supporting the men*. These ideas disagree, so an opposite-direction transition is needed. Make an annotation that says "disagree." Eliminate any answer that doesn't match.

- (A) and (C) are wrong because they are same-direction transitions.
- (B) is wrong because *Instead* introduces an alternative, but the paragraph discusses the different roles of men and women, not alternative roles for men.
- (D) is correct because *Meanwhile* shows that women had different roles during the same time period.

24. **D**

This is a Transitions question, so follow the basic approach. Highlight ideas that relate to each other. The first sentence says *some patients with damaged ear structures are not able to use traditional cochlear implants*, and the next sentence tells what *researchers are working* on as a result of this problem. These ideas agree, so a same-direction transition is needed. Make an annotation that says "agree." Eliminate any answer that doesn't match.

- (A) is wrong because there is no first step in the paragraph.
- (B) is wrong because the last sentence is not an addition to the previous sentence.
- (C) is wrong because *Finally* is used to indicate the last step or a conclusion.

- (D) is correct because *Hence* suggests that the last sentence is an effect of the previous sentence.

25. **C**

This is a Transitions question, so follow the basic approach. Highlight ideas that relate to each other. The previous sentence says *Her materials are often perishable and biological and are not traditionally used for artwork*, and the next sentence says *Yi spends almost as much time transforming these substances into completely new materials as she does creating the actual art pieces*. These ideas agree, so a same-direction transition is needed. Make an annotation that says "agree." Eliminate any answer that doesn't match.

- (A) and (B) are wrong because they are opposite-direction transitions.
- (C) is correct because *In fact* adds detail to the previous sentence.
- (D) is wrong because the last sentence is not a conclusion.

26. **D**

This is a Rhetorical Synthesis question, so follow the basic approach. Highlight the goal(s) stated in the question: *emphasize a difference between the two numeral systems*. Eliminate any answer that doesn't fulfill this purpose.

- (A) is wrong because it states a similarity between the two numeral systems.
- (B) is wrong because it doesn't mention both *numeral systems*.

- (C) is wrong because it doesn't mention a *difference* between the systems.

- (D) is correct because it states differences between the two numeral systems and uses the contrast word *while*.

27. **C**

    This is a Rhetorical Synthesis question, so follow the basic approach. Highlight the goal(s) stated in the question: *present the Newen Antug study and its conclusions*. Eliminate any answer that doesn't fulfill this purpose.

    - (A), (B), and (D) are wrong because they do not include a *conclusion*—what the researchers found.

    - (C) is correct because *canoes were used as coffins* is a conclusion.

Module 2—Easier

1. **D**

    This is a Vocabulary question, as it's asking for a *logical and precise word or phrase.* Read the passage and highlight what can help fill in the blank. The passage states that *Shakespeare intentionally provided no stage directions* as to what should happen in a scene, so it's logical that he meant for *future directors* to use their *own artistic interpretations*. A good word for the annotation box based on this information would be "freedom."

    - (A) and (B) are wrong because *confusion* and *dedication* don't match "freedom."

- (C) is wrong because it is the **Opposite** of what the passage states —Shakespeare *provided no stage directions.*

- (D) is correct because *liberty* matches "freedom."

2. **A**

   This is a Vocabulary question, as it's asking for a *logical and precise word or phrase.* Read the passage and highlight what can help fill in the blank. The passage states that the *fossils were exclusively found in caves in southern China and that anyone claiming to have found the remains of Gigantopithecus elsewhere would be mistaken.* A good phrase for the annotation box based on this information would be "only in" that region.

   - (A) is correct because *restricted to* matches "only in."

   - (B) and (D) are wrong because *eliminated from* and *unknown to* are the **Opposite** of "only in."

   - (C) is wrong because *common in* doesn't match "only in."

3. **C**

   This is a Vocabulary question, as it's asking for a *logical and precise word or phrase.* Read the passage and highlight what can help fill in the blank. The passage states that *artificial intelligence will not displace human beings* but *will undoubtedly become smarter than people within this generation*. The next sentence calls this *a possibility.* A good word for the annotation box would be that Kurzweil "hypothesizes" what will happen.

- (A) is wrong because *proves* is **Extreme Language:** it goes too far beyond "hypothesizes."
- (B) and (D) are wrong because *requires* and *denies* don't match "hypothesizes."
- (C) is correct because *predicts* matches "hypothesizes."

4. **A**

   This is a Vocabulary question, as it's asking for a *logical and precise word or phrase.* Read the passage and highlight what can help fill in the blank. The passage states that the Stanford Prison Experiment *supposedly demonstrated* an idea: *supposedly* means that the author does not think the experiment actually demonstrated that idea. The passage also notes that the individuals were of the same background *rather than* representing *a diverse sampling of subjects.* Since all of this supports the point made in the first sentence, a good word or phrase for the annotation box would be "shows" or "is an example of."

   - (A) is correct because *illustrates* matches "shows."
   - (B) and (D) are wrong because *refutes* and *critiques* are the **Opposite** tone of "shows."
   - (C) is wrong because *supersedes*, which means "overrides," doesn't match "shows."

5. **B**

   This is a Vocabulary question, as it's asking for a *logical and precise word or phrase.* Read the passage and highlight what can help fill in

the blank. The passage states that prosopagnosia is also called *"face blindness,"* so a good word for the annotation box would be the "inability" to recognize faces.

- (A) and (C) are wrong because *capability* and *tendency* are the **Opposite** of "inability."
- (B) is correct because *incapacity* matches "inability."
- (D) is wrong because *reluctance* suggests not wanting to do something, which isn't the same as "inability."

6. **B**

This is a Vocabulary question, as it's asking for a *logical and precise word or phrase.* Read the passage and highlight what can help fill in the blank. The passage states that the shark has a *competitive advantage…due to electroreception, or ability to detect electrical impulses.* A good phrase for the annotation box based on this information would be "detection ability."

- (A) and (D) are wrong because *allergy* and *aversion* are the **Opposite** of the shark's "ability" being a *competitive advantage.*
- (B) is correct because *sensitivity* matches "detection ability."
- (D) is wrong because *indifference*, which means not having a preference, doesn't match "detection ability."

7. **A**

This is a Vocabulary question, as it's asking for a *logical and precise word or phrase.* Read the passage and highlight what can help fill in the blank. The passage states that *cryptographers have yet to demonstrably decipher any portion of the text*, so a good word for the annotation box to describe *the meaning and purpose of the Voynich manuscript* would be "mysterious."

- (A) is correct because *enigmatic* matches "mysterious."
- (B) and (D) are wrong because *venerable* and *coherent* don't match "mysterious."
- (C) is wrong because it is a **Beyond the Text trap** answer. While *multifarious,* or complex, things can be *mysterious*, the words are not synonyms: mysterious things can be simple and complex things can be quite well known and understood.

8. **A**

This is a Vocabulary question, as it's asking for a *logical and precise word or phrase.* Read the passage and highlight what can help fill in the blank. The passage states after the colon that the relationship between the crocodile and bird nourishes *the bird while simultaneously promoting the crocodile's dental health.* A good phrase for the annotation box based on this information would be "mutually beneficial."

- (A) is correct because *interdependent* matches "mutually beneficial."
- (B), (C), and (D) are incorrect because *inexplicable* (puzzling), *enthralling* (fascinating), and *inarticulate* (unclear) don't match "mutually beneficial."

9. **C**

This is a Retrieval question, as it says *According to the text.* Read the passage and highlight what is said about Captain Vere. The passage states that he is a *sailor of distinction,* was *mindful of the welfare of his men, but never tolerating an infraction of discipline, versed in the science of his profession,* and *intrepid.* The correct answer should be as consistent with these qualities as possible.

- (A) is wrong because it is the **Opposite** of the passage: Vere is *mindful* of his men's welfare.
- (B) is wrong because it is **Recycled Language:** this answer misuses *nobility* from the passage, which never states that Vere has an *aristocratic background.*
- (C) is correct because it is consistent with the Vere's qualities in the passage.
- (D) is wrong because the passage doesn't state which lifestyle Vere *prefers*.

10. **D**

This is a Claims question, as it asks for an illustration of the claim in the question. Read the passage and highlight the claim made, which is that the *poem conveys the speaker's sadness that his life as an adult does not compare favorably to his childhood.*

- (A), (B), and (C) are wrong because they are all **Half-Right:** each focuses on some element or description from the speaker's

childhood but makes no comparisons to the speaker's adult life.

- (D) is correct because *'tis little joy* is consistent with sadness and *To know I'm farther off from heav'n / Than when I was a boy* is consistent with the speaker's life as an adult not comparing favorably to childhood.

11. **D**

This is a Claims question, as it asks for an illustration of the claim in the question. Read the passage and highlight the claim made, which is that *Harker conveys his belief that he has become Dracula's prisoner.*

- (A), (B), and (C) are wrong because while in each of them the speaker expresses negative emotions toward a place *(dread, loneliness, fear)*, none of these answers support the idea that the speaker is *Dracula's prisoner.*

- (D) is correct because the speaker *rushed up and down the stairs, trying every door and peering out of every window* and after this still has a feeling of *helplessness.* This would be the best support toward the idea that the narrator is at least trapped or imprisoned.

12. **C**

This is a Claims question, as it asks for an illustration of the claim in the question. Read the passage and highlight the claim made, which states that the *poem is meant to be a plea toward others to join the war effort.*

- (A), (B), and (D) are wrong because none of these answers include any call to an or group to fight or take any action.

- (C) is correct because the answer describes a *torch* that is being thrown to someone from those with *failing hands*, with the hope that the new holder would hold the torch high. These lines best support *a plea toward others* even if they don't directly reference any war effort.

13. **C**

This is a Conclusions question as it asks for an answer that *logically completes the text*. Read the passage and highlight the main ideas. The passage states that *The curator of a museum claims* that the dress was worn *at the presidential inauguration in 1865*. *Radiocarbon dating,* on the other hand, reveals that the *sleeves of the dress…date back to the 1975–2005 period.* If both are assumed to be correct as the passage says, the correct answer to the question must be consistent with both claims.

- (A) is wrong because it is **Recycled Language:** it's applying the *error range of about thirty years* to the year 1865, but the error range is mentioned when discussing radiocarbon dating in a completely separate part of the passage.

- (B) is wrong because it is a **Beyond the Text trap:** as logical as it is that dresses would be recovered more frequently from modern times than from older times, the passage does not state anything to this regard.

- (C) is correct because it shows how both claims could be correct, offering a possible reason for the contradictory statements made by the claims.

- (D) is wrong because the passage never discusses what material was used to make the dress or whether it was different from the

materials used for most other dresses.

14. **B**

This is a Conclusions question as it asks for an answer that *logically completes the text*. Read the passage and highlight the main ideas. The passage states that *paleontologists largely believed that there were no undocumented prehistoric aquatic species that had survived* to the early 1900s. However, just such a species *was found off the coast of South Africa as recently as 1938.* These two claims indicate that there is indeed at least one undocumented species that survived. The correct answer should be consistent with this idea.

- (A) is wrong because it is **Recycled Language:** this answer mentions *breeding population* from the passage, but no numbers regarding breeding population for the coelacanth are given.

- (B) is correct because the *coelacanth* from the second sentence did indeed go *undiscovered longer than* the 1900's paleontologists expected it would—they had thought there were *no undocumented prehistoric aquatic species* in their era.

- (C) is wrong because the passage never states that the scientists *ignored* any evidence.

- (D) is wrong because it is a **Beyond the Text trap:** it uses outside knowledge of when the dinosaurs went extinct to make an assumption regarding a similar fate for most coelacanths.

15. **A**

This is a Conclusions question, as it asks for an answer that *logically completes the text*. Read the passage and highlight the main idea: *The door-in-the-face technique involves initially making an outrageous or unappealing offer, which the other person is likely to refuse, then following up with a more reasonable one.* The concluding sentence to the passage must be consistent with this main idea.

- (A) is correct because the second amount requested is comparatively much smaller than the first.
- (B) is wrong because the first request of 3% is unlikely to be considered *outrageous* when compared to 2%.
- (C) is wrong because according to the door-in-the-face technique in the passage, the more *outrageous* amount should be asked for first.
- (D) is wrong because the two amounts are the same and therefore neither one would be considered *outrageous* compared to the other.

16. **A**

This is a Conclusions question, as it asks for an answer that *logically completes the text*. Read the passage and highlight the main ideas. The focus of the passage is on *NAFTA* and its relation to *manufacturing jobs.* During the interval from 1994 to 2020, the second sentence states that *the number of manufacturing jobs in the United States and Canada declined, but the total number of manufacturing jobs in the countries covered by NAFTA increased.* Therefore, a logical conclusion would explain how this might be possible.

- (A) is correct because if an increase in *the number of manufacturing jobs in Mexico*, which is also covered by NAFTA,

was greater than the *combined decreases in the United States and Canada*, this would explain the seemingly contradictory data in the second sentence.

- (B), (C), and (D) are wrong because none of them offers a reason as to how the number of manufacturing jobs in the United States and Canada declined, but the total number of manufacturing jobs in all three countries increased.

17. **D**

In this Rules question, verb forms are changing in the answer choices, so it's testing sentence structure. If the main verb is in the wrong form, the sentence won't be complete. The subject of the clause is *which*, but the clause has no verb, so the verb in the answers must be the main verb of the clause. Eliminate any answer that does not produce a complete sentence.

- (A) and (C) are wrong because an -*ing* verb can't be the main verb in a sentence.

- (B) is wrong because a "to" verb can't be the main verb in a sentence.

- (D) is correct because it's in the right form to make a complete sentence.

18. **B**

In this Rules question, pronouns and apostrophes are changing in the answer choices, so it's testing consistency with pronouns. Find and highlight the word that the pronoun refers back to: *activists*. This is

plural, so in order to be consistent, a plural pronoun is needed. Make an annotation saying "plural." Eliminate any answer that isn't consistent with *activists* or is incorrectly punctuated.

- (A) and (C) are wrong because *its* and *it's* are singular.
- (B) is correct because *their* is plural and possessive.
- (D) is wrong because *they're* means "they are."

19. **D**

In this Rules question, pronouns are changing in the answer choices, so it's testing consistency with pronouns. Find and highlight the word the pronoun refers back to, *people*, which is plural, so a plural pronoun is needed. Write an annotation saying "plural." Eliminate any answer that isn't consistent with *people*.

- (A) and (C) are wrong because they are singular.
- (B) is wrong because *you* is not appropriate to refer to *people* in this context.
- (D) is correct because *them* is plural and is consistent with *people*.

20. **D**

In this Rules question, punctuation is changing in the answer choices, so look for independent clauses. The first part of the sentence says *National flags are designed to best represent and symbolize the individual country*, which is an independent clause. The second part of the sentence says *when countries share a history or culture, their flags*

are designed to look similar…, which is also an independent clause. Eliminate any answer that can't correctly connect two independent clauses.

- (A) and (B) are wrong because neither a comma by itself nor a coordinating conjunction by itself can connect two independent clauses.
- (C) is wrong because it creates a run-on sentence.
- (D) is correct because a comma + a coordinating conjunction (FANBOYS) can connect two independent clauses.

21. **A**

In this Rules question, periods and question marks are changing in the answer choices, so it's testing questions versus statements. The last sentence says *The scientists resolved to find out*, which suggests that the previous sentence was a question. Eliminate answers that aren't correctly written as questions.

- (A) is correct because it's correctly written as a question.
- (B) is wrong because it has a question mark but is written as a statement.
- (C) and (D) are wrong because they are statements.

22. **D**

In this Rules question, verbs are changing in the answer choices, so it's testing consistency with verbs. Find and highlight the subject,

shadowing, which is singular, so a singular verb is needed. Write an annotation saying "singular." Eliminate any answer that is not singular.

- (A), (B), and (C) are wrong because they are plural.
- (D) is correct because it's singular.

23. **C**

In this Rules question, verbs are changing in the answer choices, so it's testing consistency with verbs. In this case, the verb is part of a list of two things that the beach does, the first of which is *allows community members to connect with the natural world*. Highlight the word *allows*, which the verb in the answer should be consistent with. Eliminate any answer that isn't consistent with *allows.*

- (A), (B), and (D) are wrong because *provided*, *providing*, and *provide* aren't consistent with *allows*.
- (C) is correct because *provides* is in the same tense and form as *allows*.

24. **D**

This is a Transitions question, so follow the basic approach. Highlight ideas that relate to each other. The first sentence says *Yoga is an ancient discipline that…has expanded to become popular with many different cultures*, and the next sentence says *yoga is shifting into different forms to allow a wider range of people to participate*. These ideas agree, so a same-direction transition is needed. Make an annotation that says "agree." Eliminate any answer that doesn't match.

- (A) is wrong because it is an opposite-direction transition.
- (B) is wrong because the second sentence is not about a separate but similar topic.
- (C) is wrong because *thus* indicates a conclusion.
- (D) is correct because *currently* suggests a change, which is consistent with *yoga is shifting*.

25. **C**

This is a Transitions question, so follow the basic approach. Highlight ideas that relate to each other. The first sentence says *Scientists often disagree about what traits to use to place newly discovered species in the tree of life*, and the second sentence describes a species that *is sometimes placed near modern spiders based on its acquisition of silk-spinning organs or near other arachnids based on its loss of a tail*. These ideas agree, so a same-direction transition is needed. Make an annotation that says "agree." Eliminate any answer that doesn't match.

- (A) is wrong because *as a result* suggests a conclusion that is not stated in the passage.
- (B) and (D) are wrong because they are opposite-direction transitions.
- (C) is correct because *Chimerarachne yingi* is an example of the previous sentence.

26. **A**

This is a Transitions question, so follow the basic approach. Highlight ideas that relate to each other. The first sentence says that the seismometer's detection potentially avoided *mass architectural damage*, and the second sentence says *the cut to the power prevented citizens from being caught in a dangerous location during the earthquake and allowed riders to seek shelter*. These ideas agree, so a same-direction transition is needed. Make an annotation that says "agree." Eliminate any answer that doesn't match.

- (A) is correct because allowing *riders to seek shelter* is another way the cut to power was beneficial.
- (B) is wrong because it is an opposite-direction transition.
- (C) and (D) are wrong because the second sentence is an additional point, not an example or specification.

27. **A**

This is a Rhetorical Synthesis question, so follow the basic approach. Highlight the goal(s) stated in the question: *make a generalization about the kind of study conducted by Eberhard, Wilcove, and Dobson*. Eliminate any answer that doesn't *make a generalization*.

- (A) is correct because it provides a *generalization about the kind of study* conducted by the scientists: analyzing *population trends to find out the impact of legal protections*.
- (B), (C), and (D) are wrong because they don't provide a *generalization* or a broader way of explaining the type of study.

Module 2—Harder

1. **C**

   This is a Vocabulary question, as it's asking for a *logical and precise word or phrase.* Read the passage and highlight what can help fill in the blank. The passage states that *all things, living or not, have the inclination to exist and enhance themselves*. A good word or phrase for the annotation box based on this information would be "exist" or "hold on."

   - (A), (B), and (D) are wrong because *deteriorate, perish,* and *disappear* are the **Opposite** of "exist" or "hold on."
   - (C) is correct because *persevere* matches with "exist" or "hold on."

2. **B**

   This is a Vocabulary question, as it's asking for a *logical and precise word or phrase.* Read the passage and highlight what can help fill in the blank. The passage states that the birds' behavior in the study made it *more difficult for the researchers to obtain data.* A good word for the annotation box based on this information would be "hindered."

   - (A) and (C) are wrong because *aided* and *clarified* are the **Opposite** of "hindered."
   - (B) is correct because *impeded* matches "hindered."
   - (D) is wrong because *exposed* doesn't match "hindered."

3. **C**

This is a Vocabulary question, as it's asking for a *logical and precise word or phrase.* Read the passage and highlight what can help fill in the blank. The passage states that the objects that M.C. Escher creates *first appear normal but on closer inspection are, in fact, impossible.* A good phrase for the annotation box based on this information would be "confusing objects."

- (A), (B), and (D) are wrong because *geometry, beauty,* and *color* don't match "confusing objects."
- (C) is correct because *paradox* best matches "confusing objects."

4. **D**

This is a Vocabulary question, as it's asking for a *logical and precise word or phrase.* Read the passage and highlight what can help fill in the blank. The passage states that *When microdroplets of water hit a solid surface, an electric charge* produces *hydroxyl radicals that in turn combine with remaining oxygen to form hydrogen peroxide.* This information describes a chain of events started by water, so a good phrase for the annotation box would be "likely to trigger something."

- (A), (B), and (C) are wrong because *viable, contaminated,* and *common* don't match "likely to trigger something."
- (D) is correct because *reactive* matches "likely to trigger something."

5. **A**

This is a Vocabulary question, as it's asking for a *logical and precise word or phrase.* Read the passage and highlight what can help fill in

the blank. The passage states that *The Beat Generation* had a *central message of nonconformity*, meaning that they would reject *the traditional values of the 1950s*. A good word for the annotation box based on this information would be "rejection of."

- (A) is correct because *dissension from* matches "rejection of."
- (B), (C), and (D) are wrong because *gratitude, adherence,* and *deference* all imply a positive attitude toward or at least an acknowledgment of traditional values, which is the **Opposite** of "rejection of."

6. **C**

This is a Vocabulary question, as it's asking for a *logical and precise word or phrase.* Read the passage and highlight what can help fill in the blank. In regard to *recycling used car tires*, the passage states *potentially reusing them would be beneficial* and that *walls made of used tires and dirt* are *structurally robust*, or strong. A good word for the annotation box based on this information would be that the author considers the possibility of recycling used car tires as building materials to be "promising."

- (A) and (B) are wrong because both *derivative* and *ludicrous* are negative words that are the **Opposite** tone of "promising."
- (C) is correct because *auspicious* matches with "promising."
- (D) is wrong because *innovative* is a **Beyond the Text trap** answer: the passage doesn't actually say reusing tires as the passage describes would be a new idea or has not been done before.

7. **A**

This is a Vocabulary question, as it's asking for a *logical and precise word or phrase.* Read the passage and highlight what can help fill in the blank. The passage states that *cryptographers have yet to demonstrably decipher any portion of the text*, so a good word for the annotation box to describe *the meaning and purpose of the Voynich manuscript* would be "mysterious."

- (A) is correct because *enigmatic* matches "mysterious."
- (B) and (D) are wrong because *venerable* and *coherent* don't match "mysterious."
- (C) is wrong because it is a **Beyond the Text trap** answer. While *multifarious,* or complex, things can be *mysterious*, the words are not synonyms: mysterious things can be simple, and complex things can be quite well known and understood.

8. **D**

This is a Vocabulary question, as it's asking for a *logical and precise word or phrase.* Read the passage and highlight what can help fill in the blank. The passage describes Whitsett's *ground-breaking development* and states that astronautics *owes much to him.* A good word for the annotation box based off this information would be "innovative."

- (A) and (B) are wrong because *dubious* (doubtful) and *futile* (hopeless) are the **Opposite** tone of "innovative."
- (C) is wrong because *galvanizing,* which means "stimulating," doesn't match "innovative."

- (D) is correct because *avant-garde* means “pioneering,” which matches “innovative.”

9. **A**

   This is a Retrieval question, as it says *Based on the text.* Read the passage and highlight what is said about Mr. Lorry in his interaction with Miss Manette. Mr. Lorry states that he is *a man of business* and *not much else* before telling Miss Manette he wants to tell her a story. After her repetition of the word *story,* the passage states that *He seemed willfully to mistake the word she had repeated* and acts as if she had repeated the word *customers* instead of *story.* The correct answer should be as consistent with these two descriptions of Mr. Lorry as possible.

   - (A) is correct because it is consistent with the description of Mr. Lorry before and after Miss Manette’s reply.

   - (B) and (C) are wrong because they are **Half-Right:** In (B), Mr. Lorry does not misunderstand Miss Manette’s interjection; he intentionally focuses on a different word. Similarly, in (C), it’s never stated that he *cannot keep the details of the story accurate.*

   - (D) is wrong because the passage never indicates that Miss Manette is *rude*, nor does it state that Mr. Lorry is *unthinking* in his actions.

10. **B**

    This is a Claims question, as it asks what finding would support a claim. Read the passage and highlight the claim made, which is that *Abel claims that his use of Barbeau’s text shows how anthropological*

texts can be used to portray Indigenous people differently based on the author.

- (A), (C), and (D) are wrong because they do not contain *different* portrayals of Indigenous peoples.

- (B) is correct because it focuses on one anthropologist, Marius Barbeau, choosing to portray the chiefs' feud *over constructing the largest pole as unreasonable,* while the *other anthropologists* offer a reason as to why *larger totem poles* may have been culturally important to a tribe.

11. **B**

This is a Claims question, as it asks for an illustration of a claim. Read the passage and highlight the claim made, which is that *While adult adoption remains a way for individuals to improve their economic status, the practice has its detractors as well, with some researchers arguing that it can lead to issues with the adoptee developing a firm sense of identity in his or her new environment.* The correct answer should be consistent with this claim and support both the positive and negative viewpoints toward adult adoption.

- (A) and (D) are wrong because they are **Half-Right:** both express positive opinions toward adult adoptees but fail to account for the negative opinions toward adult adoption stated in the second half of the passage.

- (B) is correct because it is consistent with both the positive and negative outcomes of adult adoption discussed in the claim.

- (C) is wrong because the distinction made in the passage is between positive and negative outcomes of adult adoption, not the

status of adult adoption in different East Asian countries.

12. **A**

This is a Claims question, as it asks for support for a hypothesis. Read the passage and highlight the hypothesis, which states that *tau protein, the mutation of which is known to cause Alzheimer's disease, is key to controlling glutamate receptors.* It's also important to note the last sentence, which clarifies that *Tau protein does not directly affect glutamate receptors but does inhibit NSF.* The correct answer should be consistent with these two sentences.

- (A) is correct because if *an excess of NSF has been shown to lead to abnormal glutamate receptor behavior,* and *tau protein…does inhibit NSF,* this would support the link made between tau proteins and glutamate receptors made in the hypothesis.

- (B) and (D) are wrong because even if true, they either disregard or do not mention *tau protein* and *glutamate receptors,* the main components of the hypothesis.

- (C) is wrong because the hypothesis is not about *what causes mutations of tau protein*, but how tau protein controls glutamate receptors.

13. **A**

This is a Claims question, as it asks for support for an argument. Read the passage and highlight Garber's argument, which states that *tulip mania is explainable by fundamental economic concepts such as supply and demand.* The correct answer will be as consistent as possible with this claim.

- (A) is correct because it discusses supply and demand, which is consistent with Garber's claim.

- (B) and (C) are wrong because even though they focus on the price of tulip bulbs, they don't discuss supply and demand.

- (D) is wrong because Garber's argument does not mention any connection between tulip bulbs and the *supply of gold coins in the Dutch republic*.

14. **A**

This is a Conclusions question as it asks for an answer that *logically completes the text*. Read the passage and highlight the main ideas. The focus of the passage is on *the use of ants to control pests.* The third sentence identifies *several positive effects*, but the last sentence mentions that *ants also have negative effects.* Therefore, a logical conclusion to the passage should expand upon the negative effects introduced in the final sentence.

- (A) is correct because it references *unintended environmental consequences,* which relate back to the negative effects described in the first half of the last sentence when ants are *used to control pests.*

- (B) and (D) are wrong because they do not focus on *negative effects* that ants may have as pest control.

- (C) is wrong because it is the **Opposite** of what the last sentence states: there are indeed *ramifications*, or negative effects, to using ants as pest control.

15. **C**

This is a Conclusions question as it asks for an answer that *logically completes the text*. Read the passage and highlight the main ideas. The focus of the passage is on *a receptor* related to *odor.* The first sentence states that *eliminating that receptor…results in the inability to smell that odor.* The second sentence states that *mosquitoes modified to lack the receptor for smelling blood would be unable to find humans,* but the third sentence says they *were still able to find humans.* Therefore, a logical conclusion to the passage should make some claim about how mosquitoes may be different from other animals.

- (A) is wrong because no comparison between *mosquitoes without damage* and *those with damage* is made in the passage.

- (B) and (D) are wrong because they are the **Opposite** of what is stated in the passage: in both cases, mosquitoes with damage to their odor receptors were still able to find humans, so there is no evidence they could not detect certain odors or would be prevented from feeding.

- (C) is correct because it indicates that mosquitoes may not *have the same correlation between receptors and the ability to sense certain odors* that other animals do.

16. **A**

This is a Conclusions question as it asks for an answer that *logically completes the text*. Read the passage and highlight the main ideas. The focus of the passage is on *NAFTA* and its relation to *manufacturing jobs.* During the interval from 1994 to 2020, the second sentence states that *the number of manufacturing jobs in the United States and Canada declined, but the total number of manufacturing jobs in the countries*

covered by NAFTA increased. Therefore, a logical conclusion would explain how this might be possible.

- (A) is correct because if an increase in *the number of manufacturing jobs in Mexico*, which is also covered by NAFTA, was greater than the *combined decreases in the United States and Canada*, this would explain the seemingly contradictory data in the second sentence.

- (B), (C), and (D) are wrong because none of them offers a reason as to how the number of manufacturing jobs in the United States and Canada declined, but the total number of manufacturing jobs in all three countries increased.

17. **C**

In this Rules question, verbs are changing in the answer choices, so it's testing consistency with verbs. Find and highlight the subject, *cloud*, which is singular, so a singular verb is needed. Write an annotation saying "singular." Eliminate any answer that is not singular.

- (A), (B), and (D) are wrong because they are plural.

- (C) is correct because it's singular.

18. **B**

In this Rules question, punctuation is changing in the answer choices. The words *behavioral neuroscientist* are a title for *Damien Fair*, so no punctuation should be used. Eliminate answers that use punctuation.

- (A), (C), and (D) are wrong because a comma isn't used before or after a title.
- (B) is correct because titles before names have no punctuation

19. **A**

In this Rules question, verbs are changing in the answer choices, so it's testing consistency with verbs. Find and highlight the subject, *map*, which is singular, so a singular verb is needed. Write an annotation saying "singular." Eliminate any answer that is not singular.

- (A) is correct because it's singular.
- (B), (C), and (D) are wrong because they are plural.

20. **A**

In this Rules question, punctuation is changing in the answer choices. The words *common insecticide* are a title for *sulfoxaflor*, so no punctuation should be used. Eliminate answers that use punctuation.

- (A) is correct because titles before names have no punctuation.
- (B), (C), and (D) are wrong because a comma isn't used before or after a title.

21. **D**

In this Rules question, punctuation with a transition is changing in the answer choices. Look for independent clauses. The first part of the

sentence says *Wichman's work to preserve the culture of Kaua'i wasn't finished*. There is an option to add *though* to this independent clause, and since it's contrasting with the previous idea, the transition should be added. Eliminate options that don't have *though* in the first part.

- (A) and (C) are wrong because they create a run-on sentence.
- (B) is wrong because it puts *Though* with the second independent clause.
- (D) is correct because *though* is part of the first independent clause.

22. **D**

In this Rules question, punctuation is changing in the answer choices, so look for independent clauses. The first part of the sentence says *Researchers studying bacteria have solved a 50-year mystery of how bacteria are able to move using appendages that are made of a single protein*, which is an independent clause. The second part of the sentence says *the subunits of the protein can exist in 11 different shapes*…, which is also an independent clause. Eliminate any answer that can't correctly connect two independent clauses.

- (A) and (C) are wrong because two independent clauses can't be linked with a comma by itself or with no punctuation at all.
- (B) is wrong because *while* is used for a contrast or for simultaneous events, which isn't the case here.
- (D) is correct because a colon can connect two independent clauses and is appropriately used when the second part explains the first.

23. **A**

This is a Transitions question, so follow the basic approach. Highlight ideas that relate to each other. The first part of the sentence says *Fault tree analysis was originally used…in high-risk fields…but other fields are experimenting* with using it, and the second part of the sentence says *fault tree analysis is also being used in low-risk fields*. These ideas agree, so a same-direction transition is needed. Make an annotation that says "agree." Eliminate any answer that doesn't match.

- (A) is correct because *increasingly* supports the change from fault tree analysis's original use to where it is begun to be used.
- (B) is wrong because it is an opposite-direction transition.
- (C) is wrong because the second sentence isn't a conclusion.
- (D) is wrong because the second sentence isn't an additional point.

24. **C**

This is a Transitions question, so follow the basic approach. Highlight ideas that relate to each other. The first part of the sentence says *she had primarily worked on canvas*, and the second part of the sentence says *but she quickly found her works evolving to include the three-dimensional space around her*. These ideas disagree, so an opposite-direction transition is needed. Make an annotation that says "disagree." Eliminate any answer that doesn't match.

- (A) is wrong because *instead* implies that the contrast is between the first and second sentence, but the contrast is between the two parts of the sentence.
- (B) and (D) are wrong because they are same-direction transitions.

- (C) is correct because *previously* is opposite-direction and supports the shift described in the sentence.

25. **D**

This is a Transitions question, so follow the basic approach. Highlight ideas that relate to each other. The previous sentence says *Some scientists believe that the fish are carried to these locations in the beaks or talons of bird*s, and this sentence describes what *new research suggests* as a different way the fish travel. These ideas disagree, so an opposite-direction transition is needed. Make an annotation that says "disagree." Eliminate any answer that doesn't match.

- (A), (B), and (C) are wrong because they are same-direction transitions.

- (D) is correct because *alternatively* is an opposite-direction transition.

26. **D**

This is a Rhetorical Synthesis question, so follow the basic approach. Highlight the goal(s) stated in the question: *emphasize the aim of the research study*. Eliminate any answer that doesn't fulfill this purpose.

- (A), (B), and (C) are wrong because they don't mention the *aim of the research study*—what researchers wanted to accomplish.

- (D) is correct because it mentions the *aim of the research study* by stating what researchers *wanted to know*.

27. **B**

This is a Rhetorical Synthesis question, so follow the basic approach. Highlight the goal(s) stated in the question: *emphasize the affiliation and purpose of Pääbo's and Skov's work*. Eliminate any answer that doesn't fulfill this purpose.

- (A), (C), and (D) are wrong because they don't mention the *affiliation*—the group or institution the scientists are associated with.

- (B) is correct because it states the *affiliation* (*Max Planck Institute for Evolutionary Anthropology*) and *purpose* (*provide insight into human evolution*).

PRACTICE TEST 2—MATH EXPLANATIONS

Module 1

1. **B**

The question asks for the frequency table that correctly represents a list of numbers. A frequency table has two columns: the left-hand column contains the values, and the right-hand column contains the number of times each value occurs, or its frequency. Work in bite-sized pieces and eliminate answer choices that do not match the data. The number 2 occurs twice in the list, so its frequency is 2. Eliminate (A) because it shows a frequency of 4 for the number 2. Eliminate (D) because it does not include the number 2 at all. Next, the number 9 occurs three times in the list, so its frequency is 3. Eliminate (C) because it shows the number 3 occurring 9 times instead of the number 9 occurring 3 times. Choice (B) shows the correct frequency for each value. The correct answer is (B).

2. **C**

The question asks for an equivalent form of an expression. One approach is to use the built-in calculator. Enter the expression given in the question, and then enter the expressions from the answer choices one at a time and stop when one of the answers produces the same graph. Only the graph of the expression in (C) matches, so it is correct.

Since the question asks for an equivalent expression and the answer choices contain variables, another approach is to plug in. Make $x = 2$, and plug it into the expression to get $2^2 - 2 - 56$, which becomes $4 - 58$, and then -54. This is the target value; write it down and circle it. Next plug $x = 2$ into each answer choice and eliminate any that do not equal the target value. Choice (A) becomes $(2 - 14)(2 + 4)$, then $(-12)(6)$, and finally -72. This does not match the target value, so eliminate (A). Choice (B) becomes $(2 - 7)(2 + 8)$, then $(-5)(10)$, and finally 50; eliminate (B). Choice (C) becomes $(2 - 8)(2 + 7)$, then $(-6)(9)$, and finally -54. This matches the target value, so keep (C), but check (D) just in case. Choice (D) becomes $(2 - 4)(2 + 14)$, then $(-2)(16)$, and finally -32; eliminate (D). Only (C) matched the target value, so it is correct.

Finally, when given a quadratic in standard form, which is $ax^2 + bx + c$, another approach is to factor it. Find two numbers that multiply to -56 and add to -1. These are -8 and 7, so the factored form of the quadratic is $(x - 8)(x + 7)$, which is (C).

Using any of these methods, the correct answer is (C).

3. **C**

The question asks for an equation that represents a specific situation. Translate the information in bite-sized pieces and eliminate after each piece. One piece of information says that the carpenter *hammers 10 nails per minute*, and another piece says that the carpenter *hammers nails for x minutes*. Multiplying the rate of 10 nails per minute by the number of minutes gives the number of nails: $\left(\frac{10 \text{ nails}}{1 \cancel{\text{ minute}}}\right)\left(x \cancel{\text{ minutes}}\right) = 10x \text{ nails}$. Eliminate (A) and (B) because they multiply the number of minutes by $\frac{1}{10}$ instead of by 10. Compare the remaining answer choices. The difference between (C) and (D) is the number on the right side of the equation. Since the carpenter *uses a combined total of 200 nails and screws*, the equation must equal 200. Eliminate (D) because it equals 3,420. The correct answer is (C).

4. **B**

The question asks for the value of the measure of an angle on a figure. Use the Geometry Basic Approach. Start by drawing a triangle on the scratch paper. Next, label the figure with the given information. Label angle *D* as 73°, angle *E* as 35°, and angle *F* without a number. Since the measures of the angles in a triangle have a sum of 180°, set up the equation $73° + 35° + F = 180°$, which becomes $108° + F = 180°$.

Subtract 108° from both sides of the equation to get $F = 72°$. The correct answer is (B).

5. **D**

The question asks about a graph representing a certain situation. In a linear graph that represents an amount over time, the y-intercept represents the initial amount. In this case, it represents the amount of plastic remaining to be recycled when $x = 0$. After 0 shifts, no plastic has been recycled yet, so the y-intercept represents the initial amount of plastic to be recycled. The correct answer is (D).

6. $\frac{12}{20}$ **or 0.6**

The question asks for a probability based on data in a table. Probability is defined as $\frac{\#\ of\ \ outcomes\ that\ \ fit\ requirements}{total\ \#\ of\ \ outcomes}$. Read the table carefully to find the numbers to make the probability. There are 200 total textbooks, so that is the *total # of outcomes*. Of these 200 textbooks, 120 are new textbooks, so that is the *# of outcomes that fit requirements*. Therefore, the probability that a textbook chosen at random is a new textbook is $\frac{120}{200}$. This cannot be entered into the fill-in box, which only accepts 5 characters when the answer is positive. All equivalent answers that fit will be accepted, so reduce the fraction or

convert it to a decimal. The correct answer is $\frac{12}{20}$, 0.6, or another equivalent form.

7. **D**

The question asks for a reasonable number based on survey results and a margin of error. Work in bite-sized pieces and eliminate after each piece. A margin of error expresses the amount of random sampling error in a survey's results. Start by applying the percent of respondents who did not support the existing registration system to the entire population of undergraduate students. Take 75% of the entire undergraduate student population to get $\frac{75}{100}(60{,}000) = 45{,}000$ students. Eliminate (A) and (B) because they are not close to this value and do not represent a reasonable number of students who did not support the existing registration system. The margin of error is 4%, meaning that results within a range of 4% above and 4% below the estimate are reasonable. A 4% margin of error will not change the result by very much, and (D) is the only answer choice close to 45,000. To check, calculate the lower limit of the range based on the margin of error, since 43,800 is less than 45,000. To find the lower limit, subtract 4% from 75% to get 71%, and then find 71% of the total population to

get a lower limit of $\frac{71}{100}(60{,}000) = 42{,}600$. The value in (C) is less than the lower limit, so it is not a reasonable number. Choice (D) contains a value between 42,600 and 45,000, so it is reasonable. The correct answer is (D).

8. **–4**

The question asks for the negative solution to an equation. One method is to enter the equation into the built-in calculator, replacing a with x in order to see a graph of the equation. The values of x are shown by vertical lines; scroll and zoom as needed to see that these cross the x-axis at –4 and 8. The question asks for the negative solution, which is –4.

To solve for a algebraically, start by multiplying both sides of the equation by a to get $32 = a(a - 4)$. Next, distribute on the right side of the equation to get $32 = a^2 - 4a$. Subtract 32 from both sides of the equation to get $0 = a^2 - 4a - 32$. Now that the equation is a quadratic in standard form, which is $ax^2 + bx + c$, factor it to find the solutions. Find two numbers that multiply to –32 and add to –4. These are 4 and –8, so the factored form of the quadratic is $0 = (a + 4)(a - 8)$. Now set each factor equal to 0 to get two equations: $a + 4 = 0$ and $a - 8 = 0$. Subtract 4 from both sides of the first equation to get $a = -4$. Add 8 to both sides of the second equation to get $a = 8$. Therefore, the negative solution to the given equation is –4.

Using either of these methods, the correct answer is –4.

9. **A**

The question asks for a description of a function that models a specific situation. Compare the answer choices. Two choices say the function is increasing, and two say it is decreasing. Since the balloon is rising, its distance above sea level is increasing over time. Eliminate (C) and (D) because they describe a decreasing function. The difference between (A) and (B) is whether the function is linear or exponential. Since the distance above sea level changes by a constant amount during each unit of time, the relationship between the balloon's distance above sea level and time is linear. Eliminate (B) because it describes an exponential function. The correct answer is (A).

10. **B**

The question asks for the x-intercept of a function. An x-intercept is a point where $y = 0$. In function notation, the number inside the parentheses is the x-value that goes into the function, or the input, and the value that comes out of the function is the y-value, or the output. Together, they represent points on the graph of the function. The answers are points that could be the x-intercept, so plug in the answers. Start with (A), and plug $x = -1$ and $y = 0$ into the function, keeping in mind that $f(x) = y$. The equation becomes $0 = (22)^{-1} - 1$. Add 1 to both sides of the equation to get $1 = (22)^{-1}$. Either use a calculator or know how to work with a negative exponent. A negative exponent means to raise the value to the positive exponent and take the reciprocal, so $(22)^{-}$

^{1} becomes $\frac{1}{22^{1}}$. The equation then becomes $1 = \frac{1}{22}$. This is not true, so eliminate (A). Next, try (B) and plug $x = 0$ and $y = 0$ into the function to get $0 = (22)^{0} - 1$. Add 1 to both sides of the equation to get $1 = (22)^{0}$. Any number raised to the power of 0 is 1, so the equation becomes $1 = 1$. This is true, so stop and pick (B).

It is also possible to answer this question using the built-in calculator. Enter the equation of the function, and then scroll and zoom as needed to see that the x-intercept is at (0, 0), making (B) correct.

Using either of these methods, the correct answer is (B).

11. **A**

The question asks for the length of a side of a geometric figure. Use the Geometry Basic Approach. Start by redrawing the figure on the scratch paper, and then label it with information from the question. Since the question asks for a specific value and the answers contain numbers in increasing order, plug in the answers. Write the answers on the scratch paper, label them as "side $\overline{AB}$," and start with a middle number. Try (B) and make $\overline{AB} = 16$. The question states that *the length of* $\overline{AB}$ *is one-third the length of* $\overline{AD}$. Given this, if $\overline{AB} = 16$, $\overline{AD} = 3(16) = 48$. The perimeter of a geometric shape is the sum of the lengths of the sides, so the perimeter of this figure is $16 + 48 + 16 + 48 = 128$. This does not match the perimeter of 64 given in the question, so eliminate (B). The result was too big, and a longer side length will make the perimeter even bigger, so eliminate (C) and (D) as well. The correct answer is (A).

12. **A**

The question asks for a value based on a geometric figure. Use the Geometry Basic Approach. Start by drawing a triangle on the scratch paper, and then label the figure with the given information. The question gives the area of the triangle, so write out the formula for the area of a triangle, $A = \frac{1}{2}bh$, and plug in the given area to get $18 = \frac{1}{2}bh$. Since the question asks for a specific value and the answers contain numbers in increasing order, plug in the answers. Write the answers on the scratch paper, label them as "*m*," and start with a middle number. Try (B), 9. If $m = 9$, the base of the triangle is $9 + 5 = 14$, and the height of the triangle is 9. Plug these numbers into the area formula to get $18 = \frac{1}{2}(14)(9)$. Simplify the right side of the equation to get $18 = 63$. This is not true, so eliminate (B). The result was too big, and a larger value of *m* will make the area even bigger, so eliminate (C) and (D) as well. The correct answer is (A).

13. **D**

The question asks for the equation that represents the relationship between two variables. When given a table of values and asked for the correct equation, plug values from the table into the answer choices to see which one works. Plugging in 0 or 1 is likely to make more than one answer work, so start with the third row of the table and plug in $s = 2$ and $c = 80$. Choice (A) becomes $80 = (1 + 3)^2$, then $80 = 4^2$, and

finally $80 = 16$. This is not true, so eliminate (A). Choice (B) becomes $80 = (1 + 5)^2$, then $80 = 6^2$, and finally $80 = 36$; eliminate (B). Choice (C) becomes $80 = 3(1 + 5)^2$, and then $80 = 3(6)^2$. Continue simplifying to get $80 = 3(36)$, and then $80 = 108$; eliminate (C). Choice (D) becomes $80 = 5(1 + 3)^2$, and then $80 = 5(4)^2$. Continue simplifying to get $80 = 5(16)$, and then $80 = 80$. This is true, so keep (D). The correct answer is (D).

14. **A**

The question asks for the number of points of intersection in a system of equations. One method is to use the built-in calculator. Enter each equation into a separate entry field, and then scroll and zoom as needed to see where, if at all, they intersect. The lines are parallel and do not intersect, making (A) correct.

To determine the number of points of intersection algebraically, first substitute $12x$ for y in the second equation to get $24x + 7 = 2(12x)$. Simplify the right side of the equation to get $24x + 7 = 24x$. Subtract $24x$ from both sides of the equation to get $7 = 0$. This is not true, so the system of equations has no solution. This means the lines are parallel and do not intersect, and (A) is correct.

Using either of these methods, the correct answer is (A).

15. **25**

The question asks for a value given a specific situation. Translate the information in bite-sized pieces. The question states that the *equation $15a + 10b = 100$ represents the situation when a of the A tiles and b of the B tiles are drawn for a total of 100 points*. Since the sum of $15a$ and

$10b$ is the number of points, and a and b are numbers of tiles, 15 and 10 must be the point values of one A tile and one B tile, respectively. To find the number of points earned by drawing 1 of each type of tile, plug in 1 for a and 1 for b to get $15(1) + 10(1) = 15 + 10 = 25$. The correct answer is 25.

16. **D**

The question asks for an equation that represents a specific situation. The value of the fund is decreasing by a certain fraction over time, so this question is about exponential decay. Write down the growth and decay formula: *final amount* = (*original amount*)$(1 \pm \textit{rate})^{\textit{number of changes}}$. In this case, d is the final amount, and the question states that the original amount was \$10,000. Eliminate (A) and (B) because they do not have 10,000 as the original amount in front of the parentheses. Since this situation involves a decrease, the original amount must be multiplied by $(1 - \textit{rate})$, and the rate here is $\frac{1}{4}$, so the value in parentheses should be $1 - \frac{1}{4}$ or $\frac{3}{4}$. Eliminate (C), which does not have this rate. The only remaining answer is (D), and it matches the growth formula, so (D) is correct.

Without this formula, it is still possible to answer this question. Plug in a value of y to see how the fund amount decreases over time. After 1

year, the fund will have $\frac{1}{4}$ less than the initial \$10,000. The value of the account will then be $\$10,000 - \frac{1}{4}(\$10,000) = \$10,000 - \$2,500 = \$7,500$. After another year, the fund will have $\frac{1}{4}$ less than \$7,500, so the value will be $\$7,500 - \frac{1}{4}(\$7,500) = \$7,500 - \$1,875 = \$5,625$. Plug $y = 2$ into the answer choices to see which results in a value of 5,625 for d. Only (D) works, so it is correct.

Using either of these methods, the correct answer is (D).

17. **C**

The question asks for the measurement of part of a geometric figure. Use the Geometry Basic Approach. Start by drawing a cylinder on the scratch paper as best as possible, and then label the figure with the given information. Write down the formula for the volume of a cylinder, either from memory or after looking it up on the reference sheet: $V = \pi r^2 h$. Plug in the values given in the question for the volume and the height to get $144\pi = \pi r^2(4)$. Divide both sides of the equation by 4π to get $36 = r^2$. Take the positive square root of both sides of the equation to get $6 = r$. Read carefully: the question asks for the diameter, not the radius. The diameter of a circle is twice the radius, so $d = 2(6)$, or $d = 12$. The correct answer is (C).

18. **C**

The question asks for the value of the x-coordinate of the solution to a system of equations. The most efficient method is to enter both equations into the built-in calculator, and then scroll and zoom as needed to find the point of intersection. The point is (6, –10), so the x-coordinate, or a, is 6, and (C) is correct.

To solve algebraically for the x-coordinate of the point of intersection, find a way to make the y-coordinates disappear when stacking and adding the equations. Compare the y-terms: the larger coefficient, 10, is 5 times the smaller one, 2. Multiply the entire first equation by –5 to get the same coefficient with opposite signs on the y terms. The first equation becomes $-5(4x + 2y) = -5(4)$ and then $-20x - 10y = -20$. Now stack and add the two equations.

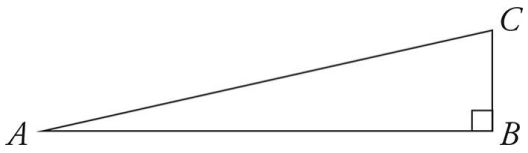
$$\begin{array}{r} -20x - 10y = -20 \\ \underline{+\ 19x + 10y = \quad 14} \\ -x \qquad\quad = \ -6 \end{array}$$

Divide both sides of the resulting equation by –1 to get $x = 6$, making (C) correct.

Using either of these methods, the correct answer is (C).

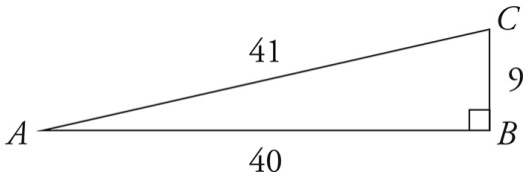
19. $\mathbf{\frac{40}{41}}$

The question asks for the value of a trigonometric function. Use the Geometry Basic Approach. Begin by drawing a triangle and labeling the vertices. The largest angle in a right triangle is the 90° angle, and the largest angle is opposite the longest side, so label angle B as a right angle. The drawing should look something like this:



Next, write out SOHCAHTOA to remember the trig functions. The SOH part defines the sine as $\frac{\text{opposite}}{\text{hypotenuse}}$, and the question states that $\sin(A) = \frac{9}{41}$, so label the side opposite angle A, which is $\overline{BC}$, as 9 and the hypotenuse, which is $\overline{AC}$, as 41. To find the length of the third side, use the Pythagorean Theorem: $a^2 + b^2 = c^2$. Plug in the known values to get $9^2 + b^2 = 41^2$. Square the numbers to get $81 + b^2 = 1{,}681$, and then subtract 81 from both sides of the equation to get $b^2 = 1{,}600$. Take the positive square root of both sides of the equation to get $b = 40$.

With all three side lengths labeled, the drawing looks like this:



To find $\sin(C)$, use the SOH part of SOHCAHTOA again. The side opposite angle C is 40, and the hypotenuse is 41, so $\sin(C) = \frac{40}{41}$. On fill-in questions, a fractional answer can also be entered as a decimal. When the answer is positive, there is room in the fill-in box for five characters, including the decimal point. In this case $\frac{40}{41} = .\overline{97560}$, which is too long. Either stop when there's no more room and enter .9756, or

round the last digit, which in this case is also .9756. It is allowed but not required to put a 0 in front of the decimal point, which would make the answer 0.975 or 0.976, but do not shorten it more than that. The correct answer is $\frac{40}{41}$ or an equivalent form.

20. **–2.5**

The question asks for the value when a quadratic function reaches its maximum. A parabola reaches its minimum or maximum value at its vertex, so find the *x*-coordinate of the vertex. One method is to enter the equation into the built-in calculator, and then scroll and zoom as needed to find the vertex. The vertex is at (–2.5, 13.5), so the value of the *x*-coordinate is –2.5.

To solve algebraically, find the value of *h*, which is the *x*-coordinate of the vertex (*h*, *k*). When a quadratic equation is in standard form, $ax^2 + bx + c$, find *h* using the formula $h = -\frac{b}{2a}$. Since $a = -6$ and $b = -30$, $h = -\frac{-30}{2(-6)}$. This becomes $h = -\frac{-30}{-12}$, and then $h = -\frac{30}{12}$. When the answer is negative, there is room in the fill-in box for six characters, including the negative sign. This fraction fits, so either enter it, reduce the fraction, or convert it to a decimal.

Using either of these methods, the correct answer is –2.5 or an equivalent form.

21. **10**

The question asks for the value of a function. The question states that the graph of function *f* and the graph of function *g* are perpendicular lines, which means they have slopes that are negative reciprocals of each other. The question gives the equation of line *f*, so find the slope of that line. This function is in the form $y = mx + b$, in which m is the slope and b is the y-intercept, so the slope of line *f* is $-\frac{1}{5}$. The negative reciprocal of $-\frac{1}{5}$ is 5, so the slope of line *g* is 5. In function notation, the number inside the parentheses is the x-value that goes into the function, or the input, and the value that comes out of the function is the y-value, or the output. Together, they represent points on the graph of the function. Thus, if $g(0) = 0$, that means line *g* contains the point (0, 0). Thus, the y-intercept, or b, is 0. Now plug $x = 2$, $m = 5$, and $b = 0$ into $y = mx + b$ to get $y = 5(2) + 0$, or $y = 10$. The correct answer is 10.

22. **2.4**

The question asks for a value in a system of equations. One method is to use the built-in calculator. Enter each equation into a separate entry

field, and then click on the slider for k. Move the slider left and right until the line intersects the parabola exactly once. It might be hard to see when this happens, so scroll and zoom as needed and click on one of the equations to see a gray dot at the point of intersection. There is one point of intersection when $k = 2.4$.

To solve for k algebraically, start by simplifying the second equation by multiplying both sides of the equation by 10 to get $y = -10x$. Now that both equations are equal to y, set them equal to each other to get $-10x = 5kx^2 + 2x + 3$. Add $10x$ to both sides of the equation to get $5kx^2 + 12x + 3 = 0$. The question states that the system *has exactly one solution*. To determine the number of solutions to a quadratic, use the discriminant. The discriminant is the part of the quadratic formula under the square root sign, and it can be written as $D = b^2 - 4ac$. When the discriminant is positive, the quadratic has exactly two real solutions; when the discriminant is 0, the quadratic has exactly one real solution; and when the discriminant is negative, the quadratic has no real solutions. Since this quadratic has exactly one real solution, the discriminant must equal 0. The quadratic is now in standard form, $ax^2 + bx + c = 0$, so $a = 5k$, $b = 12$, and $c = 3$. Plug these into the discriminant formula, along with $D = 0$, to get $0 = 12^2 - 4(5k)(3)$, which becomes $0 = 144 - 60k$. Add $60k$ to both sides of the equation to get $60k = 144$, and then divide both sides of the equation by 60 to get $k = 2.4$.

Using either of these methods, the correct answer is 2.4.

Module 2—Easier

1. **C**

The question asks for the median of a set of data. The median of a list of numbers is the middle number when the numbers are arranged in order. In lists with an even number of numbers, the median is the average of the two middle numbers. Count to see that there are 7

numbers in the list. Since there is an odd number of numbers, the median is the middle number. Since this list is already in order, cross out one number at a time from each end until only the middle number is left, like so: ~~33~~, ~~34~~, ~~38~~, 41, ~~43~~, ~~44~~, ~~47~~. The middle number is 41, so the median is 41, and (C) is correct.

It is also possible to calculate the median of a list of numbers using the built-in calculator. Type the word *median* followed by the list of numbers inside parentheses, and the calculated median will appear in the lower right corner of the entry field. The calculator shows the median as 41, so (C) is correct.

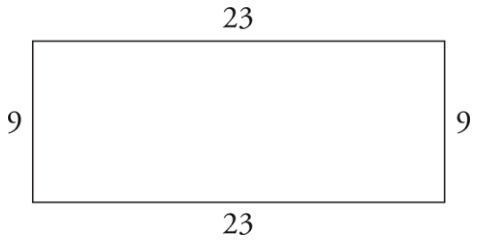
Using either of these methods, the correct answer is (C).

2. **32**

The question asks for the value of a variable based on an equation. Isolate the variable by moving everything else to the other side of the equation. Since the right side of the equation has –10, add 10 to both sides of the equation. The equation becomes 32 = y. The correct answer is 32.

3. **B**

The question asks for the perimeter of a rectangle. Use the Geometry Basic Approach. Start by drawing a rectangle on the scratch paper. Next, label the figure with information from the question. In a rectangle, opposite sides are equal, so this rectangle has two sides that are 23 inches long and two sides that are 9 inches long. The drawing should look something like this:



The perimeter of a geometric shape is the sum of the lengths of the sides. Add all four side lengths to get 9 + 23 + 9 + 23 = 64. The correct answer is (B).

4. **C**

The question asks for an equivalent form of an expression. Every term includes the variable *a* multiplied by a different number, called a coefficient. Work with the coefficients, and remember the order of operations, PEMDAS, which stands for Parentheses, Exponents, Multiply, Divide, Add, Subtract. Start inside the parentheses: $6a - 2a = 4a$. The expression becomes $15a - 4a$. Subtract the coefficients to get $15a - 4a = 11a$. The correct answer is (C).

5. **A**

The question asks for an equation that represents the relationship between two variables. Translate the English to math in bite-sized pieces. Translate *is* as equals, or =. Translate *half* as $\frac{1}{2}$. Translate *of* as times, or ×. Thus, *a is half of b* translates to $a = \frac{1}{2} \times b$. The multiplication sign is not needed when multiplying a number by a variable, so this can be written as $a = \frac{1}{2}b$. The correct answer is (A).

6. **B**

The question asks for the value of a constant given two equivalent expressions. Start by rewriting the expressions with an equals sign between them to get $\frac{3}{y+c} = \frac{15}{5y+30}$. Next, start to solve by cross-multiplying. The equation becomes $(y + c)(15) = (3)(5y + 30)$. Distribute on both sides of the equation to get $15y + 15c = 15y + 90$. Subtract $15y$ from both sides of the equation to get $15c = 90$. Divide both sides of the equation by 15 to get $c = 6$. The correct answer is (B).

7. **140**

The question asks for a value based on a percent. One method is to use the built-in calculator. The calculator automatically adds "of" after the percent sign, so enter "70%" and then "200" into an entry field. The result in the lower right corner of the entry field is 140, which is correct.

Another method is to translate the English to math in bite-sized pieces. *Percent* means out of 100, so translate 70% as $\frac{70}{100}$. Translate *how many* as a variable, such as d for dogs. Translate *of* as times, or ×. Translate *the pets* as 200. The equation becomes $d = \left(\frac{70}{100}\right)(200)$. Solve the equation by hand or on a calculator to get $d = 140$.

Using either of these methods, the correct answer is 140.

8. **A**

The question asks for a value given a rate. Begin by reading the question to find information about the rate. The question states that James *drives at an average speed of 20 miles per hour*. Set up a proportion to determine how many hours it will take James to drive 100 miles. The proportion is $\frac{20 \text{ miles}}{1 \text{ hour}} = \frac{100 \text{ miles}}{x \text{ hours}}$. Cross-multiply to get $(20)(x) = (1)(100)$, or $20x = 100$. Divide both sides of the equation by 20 to get $x = 5$. The correct answer is (A).

9. **44**

The question asks for the value of an expression given an equation. When an SAT question asks for the value of an expression, there is usually a straightforward way to solve for the expression without needing to completely isolate the variable. Since $4y$ is four times y and 16 is four times 4, multiply the entire equation by 4 to get $(4)(y - 4) = (4)(11)$. The equation becomes $4y - 16 = 44$. The correct answer is 44.

10. **D**

The question asks for the value of a function. In function notation, the number inside the parentheses is the x-value that goes into the function, or the input, and the value that comes out of the function is the y-value,

or the output. The question provides an input value, so plug $x = 3$ into the function to get $g(3) = 3^2 - 1$, which becomes $g(3) = 9 - 1$, and then $g(3) = 8$. The correct answer is (D).

11. **D**

The question asks for the value of a function that represents a situation. In function notation, the number inside the parentheses is the x-value that goes into the function, or the input, and the value that comes out of the function is the y-value, or the output. The question provides the number of items, which is represented by x, so plug $x = 2{,}000$ into the function to get $p(2{,}000) = 2(2{,}000) + 150$, which becomes $p(2{,}000) = 4{,}000 + 150$, and then $p(2{,}000) = 4{,}150$. The correct answer is (D).

12. **B**

The question asks for the value of a function. In function notation, the number inside the parentheses is the x-value that goes into the function, or the input, and the value that comes out of the function is the y-value, or the output. The question provides an input value, so plug $x = 6$ into the function to get $f(6) = \frac{2}{3}(6)$, which becomes $f(6) = 4$. The correct answer is (B).

13. **118**

The question asks for the value of an angle on a figure. Use the Geometry Basic Approach. Start by redrawing the figure on the scratch paper, and then label the figure with the given information. The fact that two of the lines are parallel will be important on some questions about lines and angles, but here it's unnecessary information. Instead, since d and 62 make up a straight line and there are 180° in a line, $d + 62 = 180$. Subtract 62 from both sides of the equation to get $d = 118$. The correct answer is 118.

14. **A**

The question asks for the value of an expression given the equation of a graph in the xy-plane. One method is to use the built-in calculator. Enter the equation of the line, and then scroll and zoom as needed to find the intercepts. The x-intercept is at (5.667, 0), and the y-intercept is at (0, –4.25). Thus, $c = 5.667$, $k = -4.25$, and $\frac{c}{k} = \frac{5.667}{-4.25} = -1.33$. This is the same value as $-\frac{4}{3}$, which makes (A) correct.

To solve algebraically, plug the given points into the equation of the line. Plug in $x = c$ and $y = 0$ to get $3c - 4(0) = 17$, or $3c = 17$. Divide both sides of the equation by 3 to get $c = \frac{17}{3}$. Next, plug in $x = 0$ and $y =$

k to get $3(0) - 4k = 17$, or $-4k = 17$. Divide both sides of the equation by -4 to get $k = -\frac{17}{4}$. Finally divide c by k to get $\frac{c}{k} = \frac{\frac{17}{3}}{-\frac{17}{4}}$. When dividing fractions, multiply the reciprocal of the fraction in the denominator by the fraction in the numerator. This becomes $\frac{c}{k} = \left(\frac{17}{3}\right)\left(-\frac{4}{17}\right)$, and then $\frac{c}{k} = -\frac{4}{3}$, and (A) is correct.

Using either of these methods, the correct answer is (A).

15. **D**

The question asks for a value given a rate. Begin by reading the question to find information about the rate. The question states that the machine *processes mail at a constant rate of 21 pieces of mail per minute*. Set up a proportion to determine how many pieces of mail the machine will process in 7 minutes, being sure to match up units. The proportion is $\frac{21 \text{ pieces of mail}}{1 \text{ minute}} = \frac{x \text{ pieces of mail}}{7 \text{ minutes}}$. Cross-multiply to get $(1)(x) = (21)(7)$, or $x = 147$. The correct answer is (D).

16. **B**

The question asks for an equation that represents a specific situation. Translate the information in bite-sized pieces and eliminate after each piece. One piece of information says that Stella will send 24 invitations *each day for the next d days*. Since *d* represents the number of days, it should be multiplied by 24. Eliminate (C) and (D) because they multiply *d* by 43 instead of 24. Compare the remaining answer choices. The difference between (A) and (B) is whether 43 is added to 24*d* or subtracted from 24*d*. Since Stella *has already sent 43 invitations* and will send a total of 211 invitations, 43 should be added to 24*d* and set equal to 211. Eliminate (A) because it uses subtraction. The correct answer is (B).

17. **B**

The question asks for the function that represents values given in a table. In function notation, the number inside the parentheses is the *x*-value that goes into the function, or the input, and the value that comes out of the function is the *y*-value, or the output. Together, they represent points on the graph of the function. The table shows pairs of values for *x* and $f(x)$, and the correct function must work for every point on the graph. Plug in values from the table and eliminate functions that don't work. Since plugging in 0 or 1 is likely to make more than one answer work, start with the fourth column in the table and plug in $x = 2$ and $f(x) = 21$. Choice (A) becomes $21 = 3(2) + 12$, then $21 = 6 + 12$, and finally $21 = 18$. This is not true, so eliminate (A). Choice (B) becomes $21 = 3(2) + 15$, then $21 = 6 + 15$, and finally $21 = 21$. This is true, so keep (B), but check the remaining answers with this pair of values. Choice (C) becomes $21 = 15(2) + 12$, then $21 = 30 + 12$, and finally $21 = 42$;

eliminate (C). Choice (D) becomes $21 = 15(2) + 15$, then $21 = 30 + 15$, and finally $21 = 45$; eliminate (D). Only the equation in (B) worked with this pair of values, so stop here. The correct answer is (B).

18. **C**

The question asks for the term in an equation that represents a specific part of a scenario. The question states that s represents *the number of seconds since the rocket was launched* and asks for the height when the rocket was launched. No time had elapsed at the instant the rocket was launched, so plug $s = 0$ into the equation. The equation becomes $h = -16(0)^2 + 64(0) + 21$. Simplify the right side of the equation to get $h = 0 + 0 + 21$, or $h = 21$. Since the height at the time of 0 seconds is 21 feet, that number represents the initial height, or the height of the rooftop, and (C) is correct.

Another method is to enter the equation into the built-in calculator, and then scroll and zoom as needed to find the y-intercept, which represents the height of the rocket 0 seconds after launch. Click on the gray dot to see that the coordinates are (0, 21), so the height of the rooftop is 21, and (C) is correct.

Using either of these methods, the correct answer is (C).

19. **D**

The question asks for correct values in a function. In function notation, the number inside the parentheses is the x-value that goes into the function, or the input, and the value that comes out of the function is the y-value, or the output. When given a function and asked for the table of values, plug values from the answer choices into the function

and eliminate answers that don't work. Start with $x = 2$ because two answers pair it with $y = 3$ and two pair it with $y = 9$, so this will eliminate half of the answer choices. Plug $x = 2$ into the function to get $f(2) = 2^3 + 1$, which becomes $f(2) = 8 + 1$, and then $f(2) = 9$. Eliminate (A) and (B) because they both have $y = 3$ for this x value. The third pair of values is the same in (C) and (D), so try the second pair of values and plug $x = 3$ into the function. The function becomes $f(3) = 3^3 + 1$, then $f(3) = 27 + 1$, and then $f(3) = 28$. Eliminate (C). The correct answer is (D).

20. **A**

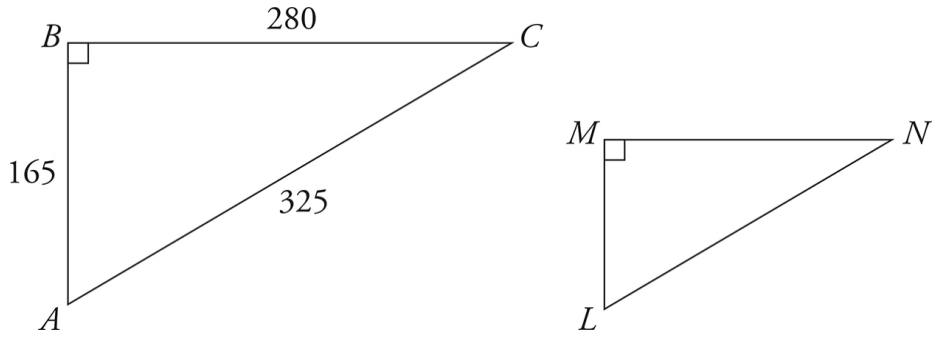
The question asks for the equation that defines a function. In function notation, the number inside the parentheses is the x-value that goes into the function, or the input, and the value that comes out of the function is the y-value, or the output. The question provides two pairs of input and output values, so plug those into the answer choices and eliminate answers that don't work with both pairs. Start by plugging $x = –1$ and $h(x) = 3$ into the answer choices. Choice (A) becomes $3 = 2(–1) + 5$, then $3 = –2 + 5$, and finally $3 = 3$. This is true, so keep (A), but check the remaining answers with the first pair of values. Choice (B) becomes $3 = 2(–1) + 3$, then $3 = –2 + 3$, and finally $3 = 1$. This is not true, so eliminate (B). Choice (C) becomes $3 = 2(–1)$, and then $3 = –2$; eliminate (C). Choice (D) becomes $3 = 3(–1) + 5$, then $3 = –3 + 5$, and finally $3 = 2$; eliminate (D). Only the equation in (A) worked with the first pair of values, so stop here. The correct answer is (A).

21. **D**

The question asks for an equation in terms of a specific variable. The question asks about the relationship among variables and there are variables in the answer choices, so one option is to plug in. That might get messy with three variables, and all of the answer choices have r by itself, so the other option is to solve for r. To begin to isolate r, add $6s$ to both sides of the equation to get $p + 6s = 13r$. Divide both sides of the equation by 13 to get $\frac{p+6s}{13} = r$. Flip the sides of the equation to get $r = \frac{p+6s}{13}$. The correct answer is (D).

22. **A**

The question asks for the value of a trigonometric function. Use the Geometry Basic Approach. Start by drawing two right triangles that are similar to each other, meaning they have the same proportions but are different sizes. Be certain to match up the corresponding angles that are given in the question, and put the longest side opposite the right angle. Next, label the sides of triangle ABC with the lengths given in the question. The drawing should look something like this:



The question asks for the cosine of angle L, which corresponds to angle A. Trig functions are proportions, so $\cos(L) = \cos(A)$, and it is possible to answer the question without knowing any of the side lengths of triangle LMN. To find $\cos(A)$, use SOHCAHTOA to remember the trig functions. The CAH part of the acronym defines the cosine as $\frac{\text{adjacent}}{\text{hypotenuse}}$. The side adjacent to A is 165, and the hypotenuse is 325, so $\cos(A) = \frac{165}{325}$. Since $\cos(L) = \cos(A)$, $\cos(L)$ is also $\frac{165}{325}$. To match the result with an answer choice, either use a calculator to find the decimal equivalent or reduce the fraction. Using a calculator, $\frac{165}{325} \approx 0.5077$ and $\frac{33}{65} \approx 0.5077$. To reduce the fraction, notice that both numbers are multiples of 5, so divide the numerator and denominator by 5 to get $\cos(L) = \frac{33}{65}$. Either way, the correct answer is (A).

Module 2—

Harder 1. A

The question asks for an equivalent form of an expression. Use Bite-Sized Pieces and the Process of Elimination to tackle this question. The only term with a single a is $6a$, so it cannot be combined with any other terms and must appear in the correct answer. Eliminate (B) and (C) because they do not include $6a$. Combine the two terms with a^3 to get $3a^3 - 5a^3 = -2a^3$. Eliminate (D) because it does not include $-2a^3$. The correct answer is (A).

2. **A**

The question asks for a percent based on the information provided. Start by ballparking: 10% of 45,000,000 is 4,500,000, so 4,950,000 is a little more than 10%. Eliminate (C) and (D) because they are much too large. Choice (A) is likely correct, but to check, plug in 11%. *Percent* means out of 100, so 11% can be represented as $\frac{11}{100}$. Multiply this by the total number of shirts to get $\frac{11}{100}(45{,}000{,}000) = 4{,}950{,}000$. This matches the number of white shirts given in the question. The correct answer is (A).

3. **–120**

The question asks for the value of an expression based on an equation. When an SAT question asks for the value of an expression, there is usually a straightforward way to solve for the expression without needing to completely isolate the variable. Start solving by distributing on both sides of the equation. The equation becomes $3x - 24 - 16 = 8x + 80 + x$. Simplify both sides of the equation to get $3x - 40 = 9x + 80$. Subtract $3x$ from both sides of the equation to get $-40 = 6x + 80$, and then subtract 80 from both sides of the equation to get $-120 = 6x$. The question asked for the value of $6x$, so stop here and enter –120.

Another method is to enter the equation as written into the built-in calculator, and then scroll and zoom as needed to see the value of x represented by a vertical line at $x = -20$. Read carefully: the question asks for the value of $6x$, which is $6(-20)$, or –120.

Using either of these methods, the correct answer is –120.

4. **B**

The question asks for the value of an expression based on an equation. When an SAT question asks for the value of an expression, there is usually a straightforward way to solve for the expression without needing to completely isolate the variable. Start by subtracting $8(a - 3)$ from both sides of the equation to get $-17 = 9(a - 3) - 8(a - 3)$. Combine the terms with $(a - 3)$ to get $-17 = (9 - 8)(a - 3)$, which becomes $-17 = 1(a - 3)$, or $-17 = a - 3$, making (B) correct.

Another method is to enter the equation into the built-in calculator, changing every a to x in order to see a graph, and then scroll and zoom as needed to see the value of a represented by a vertical line at $x = -14$. Read carefully: the question asks for the value of $a - 3$, which is $-14 - 3$, or -17, and (B) is correct.

Using either of these methods, the correct answer is (B).

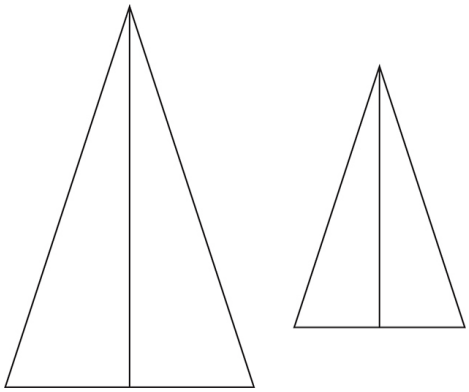
5. **C**

The question asks for the meaning of a constant in context. Start by reading the final question, which asks for the meaning of the constant b. Next, label the parts of the equation with the information given. The question states that the lab area is 30 square feet, the seating area is 80 square feet, and the total number of floor tiles is 4,200. Rewrite the equation with these labels: (lab area size)(a) + (seating area size)(b) = total tiles. Next, use Process of Elimination to get rid of answer choices that are not consistent with the labels. Since b is multiplied by the size of the seating area, eliminate (A) and (B) because they refer to the lab

area, not the seating area. Compare the remaining answer choices. The difference is between the average number of tiles and the total number of tiles. Since *b* is multiplied by the number of square feet in the seating area, it must represent a value per square foot, not a total value. Keep (C) because it is consistent with this information, and eliminate (D) because it refers to a total number. The correct answer is (C).

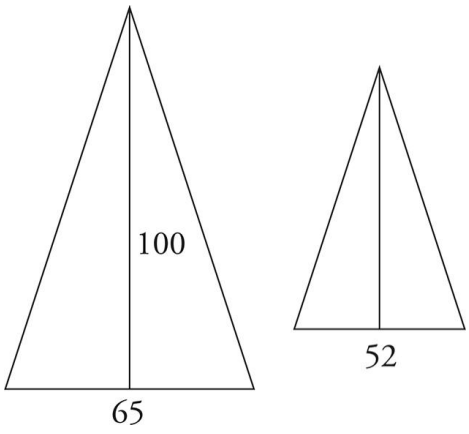
6. **D**

The question asks for the change in a value given a proportion. Use the Geometry Basic Approach. Start by drawing two triangles, one with a smaller base than the other. The question asks about the height, so draw a line for the height. This figure should look something like this:



Next, label the figure with the information given. Since no specific numbers are given for the base and the height, plug in. Make the height of the larger triangle 100, so the base would be 65% of 100, which is 65. If the base decreased by 13 inches, the new base would be 65 – 13 = 52 inches.

Label this information on the figure, which now looks like this:



Since the base is smaller and the proportions stay the same, the height must also be smaller. Eliminate (A) and (B) because they would both make the height larger. To find the length of the new height, set up a proportion for $\frac{\text{base}}{\text{height}}$: $\frac{65}{100} = \frac{52}{x}$. Cross-multiply to get (100)(52) = (65)(x). Simplify both sides of the equation to get 5,200 = 65x. Divide both sides of the equation by 65 to get 80 = x. Since the original height was 100, the change is 100 – 80 = 20. The new height is less than the original height, so it decreased by 20. The correct answer is (D).

7. **B**

The question asks for an equation in terms of a specific variable. Since the question is about the relationship between variables and the answers contain variables, plug in. The fraction on the left side of the equation

could make the numbers awkward, so start on the right side of the equation and make $b = 2$. The equation becomes $\frac{a}{3} = 10 - 7(2)$, then $\frac{a}{3} = 10 - 14$, and finally $\frac{a}{3} = -4$. Multiply both sides of the equation by 3 to get $a = -12$. Now plug $a = -12$ and $b = 2$ into the answer choices and eliminate any that do not work. Choice (A) becomes $2 = \frac{-12 - 21}{30}$, and then $2 = -\frac{33}{30}$. This is not true, so eliminate (A). Choice (B) becomes $2 = \frac{30 - (-12)}{21}$, then $2 = \frac{42}{21}$, and finally 2 = 2. This is true, so keep (B), but check the remaining answers just in case. Choice (C) becomes $2 = 10 + \frac{-12}{3}$, then 2 = 10 + (–4), and finally 2 = 6; eliminate (C). Choice (D) becomes $2 = 10 + \frac{3}{-12}$, then $2 = 10 + \left(-\frac{1}{4}\right)$, and finally $2 = 9\frac{3}{4}$; eliminate (D). The correct answer is (B).

8. **B**

The question asks for the value of a constant given two equivalent expressions. Start by rewriting the expressions with an equal sign between them to get $\frac{3}{y + c} = \frac{15}{5y + 30}$. Next, start to solve by cross-multiplying. The equation becomes $(y + c)(15) = (3)(5y + 30)$. Distribute on both sides of the equation to get $15y + 15c = 15y + 90$.

Subtract $15y$ from both sides of the equation to get $15c = 90$. Divide both sides of the equation by 15 to get $c = 6$. The correct answer is (B).

9. **25**

The question asks for the value of a constant given information about circles in the coordinate plane. The equation of a circle in standard form is $(x - h)^2 + (y - k)^2 = r^2$, where (h, k) is the center and r is the radius. In the equation given for circle O, $r^2 = 64$. Take the positive square root of both sides of the equation to get $r = 8$. The question states that *the radius of circle P is three less than the radius of circle O*, so the radius of circle P is $8 - 3 = 5$. Plug $r = 5$ into the equation of circle P to get $(x - 7)^2 + (y + 7)^2 = 5^2$, or $(x - 7)^2 + (y + 7)^2 = 25$. Thus, $c = 25$. The correct answer is 25.

10. **C**

The question asks for a maximum value given a specific situation. Since the question asks for a specific value and the answers contain numbers in increasing order, plug in the answers. Rewrite the answer choices on the scratch paper and label them "number of laptops." Next, pick a value to start with. Since the question asks for the maximum, start with the largest number, 146. The question states that *each laptop costs $149*, so multiply that by the number of laptops to get ($149)(146) = $21,754. The question also states that there is *a 7.5% discount*

on orders of at least 100 laptops. Since 146 is more than 100, the discount applies. Take 7.5% of the cost and subtract the result from the cost to get $\$21,754 - \left(\frac{7.5}{100}\right)(\$21,754) = \$20,122.45$. This is greater than the donation of $20,000, so eliminate (D). The result was close, so plug in the next largest value, 145, for the number of laptops. The initial cost becomes ($149)(145) = $21,605. Apply the 7.5% discount to get $\$21,605 - \left(\frac{7.5}{100}\right)(\$21,605) \approx \$19,984.63$. This is less than the donation of $20,000, so the school can purchase 145 laptops. The correct answer is (C).

11. **A**

The question asks for the value of the x-coordinate of the solution to a system of equations. The most efficient method is to enter both equations into the built-in calculator, and then scroll and zoom as needed to find the points of intersection. The graph shows two points of intersection: (3, 1) and (–4, 22), so the x-coordinate is either 3 or –4. Only –4 is in an answer choice, so choose (A).

To solve the system for the x-coordinate algebraically, substitute $-3x + 10$ for y in the first equation to get $3x^2 - (-3x + 10) - 26 = 0$. Distribute the negative sign to get $3x^2 + 3x - 10 - 26 = 0$, and then combine like terms to get $3x^2 + 3x - 36 = 0$. Factor out 3 to get $3(x^2 + x - 12) = 0$. Factor the quadratic to get $3(x + 4)(x - 3) = 0$. Set each factor equal to 0 and solve to get $x = -4$ and $x = 3$. Only –4 is in an answer choice, so choose (A).

Using either of these methods, the correct answer is (A).

12. **A**

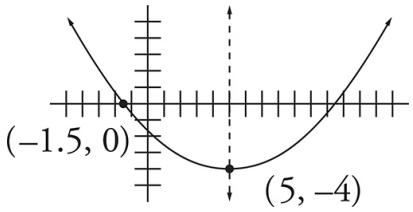
The question asks for the number of solutions to an equation. Distribute on both sides of the equation to get $-24x - 12 = 12 - 24x$. Add $24x$ to both sides of the equation to get $-12 = 12$. This is not true, so the equation has no solutions, and (A) is correct.

It is also possible to answer this question using the built-in calculator. Enter each side of the equation into a separate entry field, and then scroll and zoom as needed to see that the lines are parallel. This means there are no solutions, and (A) is correct.

Using either of these methods, the correct answer is (A).

13. **D**

The question asks for an x-intercept of a parabola. Sketch a graph using the given points, and label those points. The vertex of a parabola is on the axis of symmetry, so the axis of symmetry of this parabola is the line $x = 5$; add this line to the graph. The graph should look something like this:



The two x-intercepts are an equal distance from the line of symmetry. The x-coordinate of the given x-intercept is –1.5, so the distance from

the line of symmetry is $5 - (-1.5) = 6.5$. The x-coordinate of the other x-intercept is thus $5 + 6.5 = 11.5$. The correct answer is (D).

14. **C**

The question asks for an equation that represents a graph. One approach is to enter the equation from each answer choice into the built-in calculator. Since the graph shown in the question has been translated, or shifted, down 10 units from the graph of $g(x)$, the correct answer should result in a graph that is 10 units up from the graph shown in the question. The graph of the equation in (C) does this, so (C) is correct.

Another approach is to compare features of the graph to the answer choices. The answer choices all take the form $y = mx + b$, in which m is the slope and b is the y-intercept. All of the answer choices have the same slope, so focus on the y-intercept. The graph shown in the question has been translated from the graph of function g. Adding or subtracting outside the parentheses shifts the graph up or down. Thus, the given graph of $g(x) - 10$ is shifted 10 units down from the graph of $g(x)$. Undo this by adding 10 to transform the given graph back to $g(x)$. The graph of $g(x) - 10$ has its y-intercept at $(0, -5)$. Move the point up 10 units to get a y-intercept of $(0, 5)$. Eliminate (A), (B), and (D) because the equations have the wrong y-intercept, leaving (C) as correct.

Using either of these methods, the correct answer is (C).

15. **D**

The question asks for the value of a constant in a quadratic equation. One method is to use the built-in calculator, although it will take some experimentation. Start by entering the equation into an entry field. The slider for c does not appear, so add $5x$ to both sides of the equation to get $10x^2 + 5x + c = 0$. It might be necessary to delete "= 0" to show the slider and then add it back to see the graph. Click on the slider for c, and then either move the slider left and right or enter each answer choice into the "c =" equation one at a time. The parabola does not intersect the x-axis when $c = 1$, meaning there are no real solutions and (D) is correct.

To determine algebraically when a quadratic equation has no real solutions, use the discriminant. The discriminant is the part of the quadratic formula under the square root sign and is written as $D = b^2 – 4ac$. When the discriminant is positive, the quadratic has exactly two real solutions; when the discriminant is 0, the quadratic has exactly one real solution; and when the discriminant is negative, the quadratic has no real solutions. Thus, the discriminant of this quadratic must equal a negative number. First, put the quadratic in standard form, which is $ax^2 + bx + c = 0$, by adding $5x$ to both sides of the equation to get $10x^2 + 5x + c = 0$. Now $a = 10$, $b = 5$, and $c = c$. Plug these into the discriminant formula to get $D = (5)^2 – 4(10)(c)$, or $D = 25 – 40c$. Next, plug in the values from the answer choices to see which value of c makes the discriminant negative. Start with a middle answer and try (C), 0. If $c = 0$, the discriminant becomes $D = 25 – 40(0)$, or $D = 25$. This is not negative, so eliminate (C). It might not be clear whether a larger or smaller number is needed, so pick a direction and try (D), 1. If $c = 1$, the discriminant becomes $D = (5)^2 – (4)(10)(1)$, or $D = 25 – 40$, and then $D = –15$. This is negative, so stop here and pick (D).

Using either of these methods, the correct answer is (D).

16. **A**

The question asks for the value of an expression given the equation of a graph in the *xy*-plane. One method is to use the built-in calculator. Enter the equation of the line, and then scroll and zoom as needed to find the intercepts. The *x*-intercept is at (5.667, 0), and the *y*-intercept is at (0, –4.25). Thus, $c = 5.667$, $k = -4.25$, and $\frac{c}{k} = \frac{5.667}{-4.25} = -1.33$. This is the same value as $-\frac{4}{3}$, which makes (A) correct.

To solve algebraically, plug the given points into the equation of the line. Plug in $x = c$ and $y = 0$ to get $3c - 4(0) = 17$, or $3c = 17$. Divide both sides of the equation by 3 to get $c = \frac{17}{3}$. Next, plug in $x = 0$ and $y = k$ to get $3(0) - 4k = 17$, or $-4k = 17$. Divide both sides of the equation by –4 to get $k = -\frac{17}{4}$. Finally divide c by k to get $\frac{c}{k} = \frac{\frac{17}{3}}{-\frac{17}{4}}$. When dividing fractions, multiply the reciprocal of the fraction in the denominator by the fraction in the numerator. This becomes $\frac{c}{k} = \left(\frac{17}{3}\right)\left(-\frac{4}{17}\right)$, and then $\frac{c}{k} = -\frac{4}{3}$, and (A) is correct.

Using either of these methods, the correct answer is (A).

17. **12**

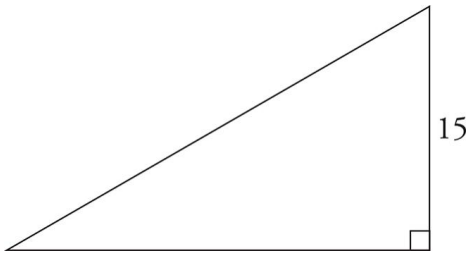
The question asks for the value of a constant in a system of equations. When a system of linear equations has infinitely many solutions, the two equations form the same line and are equivalent to each other. Since c is a coefficient of g, look for a way to cancel the f-terms and the constants when stacking and adding the equations. First, put the two equations in the same order by subtracting $21g$ from both sides of the second equation to get $21 = 6f - 36g$, and then subtracting $6f$ from both sides of the second equation to get $21 - 6f = -36g$. The f-term and constant of the second equation are both 3 times the equivalent terms in the first equation with opposite signs, so multiply the first equation by 3 to get $-21 + 6f = 3cg$. Now stack and add the equations.

$$\begin{array}{r} -21 + 6f = 3cg \\ \underline{+\ 21 - 6f = -36g} \\ 0 + 0 = 3cg - 36g \end{array}$$

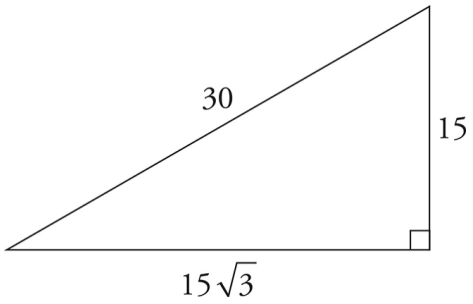
Add $36g$ to both sides of the resulting equation to get $36g = 3cg$. Divide both sides of the equation by $3g$ to get $12 = c$. The correct answer is 12.

18. **C**

The question asks for the perimeter of a triangle. Use the Geometry Basic Approach. Start by drawing a triangle on the scratch paper with a right angle and one of the remaining angles twice the size of the other. Next, label the figure with the information given, and label the shortest side as 15. The drawing should look something like this:



A 30:60:90 triangle is one of the special right triangles that has a specific proportional relationship among the sides. The proportion can be found by clicking open the reference sheet, and it is $x{:}15\sqrt{3}{:}2x$. Since the smallest side is 15, $x = 15$. The other sides are $x\sqrt{3}$ and 2(15) = 30. Label the figure with this information; the figure now looks like this:



The perimeter of a geometric shape is the sum of the lengths of all of the sides. Add all three side lengths to get $15 + 15\sqrt{3} + 30$, and then combine like terms to get $45 + 15\sqrt{3}$. The correct answer is (C).

19. **B**

The question asks for the value of an expression based on information about a function. In function notation, the number inside the parentheses is the x-value that goes into the function, or the input, and the value that comes out of the function is the y-value, or the output. The table gives four pairs of input and output values for the function.

To solve for the constants c and d, start by plugging in one of the pairs from the table. Plug $x = 2$ and $g(x) = 46$ into the function to get $46 = 2c + d$. There is no way to solve for $c + d$ using only this equation, so plug in a second pair of values. Plug $x = 4$ and $g(x) = 0$ into the function to get $0 = 4c + d$. There are now two equations with two constants, so find a way to make one of the constants disappear when stacking and adding the equations. Multiply the second equation by –1 to get $0 = -4c - d$. The d-terms are now the same with opposite signs, so stack and add the two equations.

$$\begin{array}{r} 46 = 2c + d \\ +\quad 0 = -4c - d \\ \hline 46 = -2c \end{array}$$

Divide both sides of the resulting equation by –2 to get $c = -23$. Plug $c = -23$ into the first equation to get $46 = 2(-23) + d$, or $46 = -46 + d$. Add 46 to both sides of the equation to get $92 = d$. Add the values of the two constants to get $c + d = -23 + 92 = 69$, so (B) is correct.

Another method is to recognize that the equation is in slope-intercept form, $y = mx + b$, in which m is the slope and b is the y-intercept. In this case, the constant c is the slope and the constant d is the y-intercept.

Find the slope by putting two points from the table, such as (2, 46) and (4, 0), into the formula $slope = \frac{y_2 - y_1}{x_2 - x_1}$. The formula becomes $slope = \frac{46 - 0}{2 - 4}$, then $slope = \frac{46}{-2}$, and finally $slope = -23$. Thus, $c = -23$. To find the y-intercept, note that the values of $g(x)$ in the table decrease by 46

each time the x-value increases by 2. The reverse will also be true: when x decreases by 2 to be 0, $g(x)$ will increase by 46 to be 92. This means that the y-intercept is (0, 92), and $d = 92$. If $c = -23$ and $d = 92$, the value of $c + d$ is $-23 + 92$, or $c + d = 69$, making (B) correct.

Using either of these methods, the correct answer is (B).

20. **105**

The question asks for a value given information about the mean, or average, of a data set. One method is to use the built-in calculator. Type *mean(114,109,106,111)* to see the mean of the original data set in the lower right corner. The mean is 110, so the mean of the new data set must be an integer less than 110. Add a fifth integer to the list of numbers in parentheses until the conditions of the question are met. The question asks for the smallest integer and states that the integers are greater than 101, so start with 102. Add 102 to the list of numbers in parentheses, and the mean becomes 108.4. This is not an integer, so keep going. When the new integer is 103, the mean is 108.6. When the new integer is 104, the mean is 108.8. When the new integer is 105, the mean is 109. Thus 105 is the smallest integer that results in a mean that is *an integer that is less than the mean of the four integers.* Be careful to enter the new integer, 105, not the new mean, 109. The correct answer is 105.

Another method is to use the formula $T = AN$, in which T is the *Total*, A is the *Average*, and N is the *Number of things*. Start by finding the mean of the four integers given in the question. There are 4 values, so $N = 4$. Find the *Total* by adding the four integers to get $T = 114 + 109 + 106 +$

111 = 440. The average formula becomes 440 = (A)(4). Divide both sides of the equation by 4 to get A = 110. The question asks for the smallest integer that results in the full data set having an average less than that of the four integers shown, which is 110. Start with the next smallest integer, 109, for the average, and solve for the fifth integer in the data set. The average formula becomes T = (109)(5), so T = 545. The total of the first four integers was 440, so the fifth integer is 545 – 440 = 105. The question also states that *the mean of the entire data set is an integer* and that all of the integers are *greater than 101*, and 105 meets both of these conditions. To see whether a smaller integer meets all of the conditions given in the question, try an average of 108. The *Total* is now T = (108)(5) = 540, and the fifth integer is 540 – 440 = 100. This is not greater than 101, so 100 is too small. Thus, 105 is the smallest integer that meets the conditions, and it is correct.

Using either of these methods, the correct answer is 105.

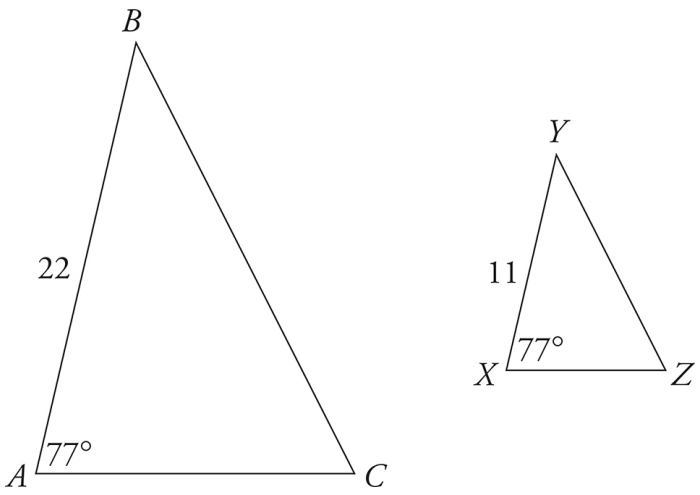
21. **B**

The question asks for the function that represents a certain situation. There are variables in the answer choices, and the question asks about the relationship between the number of points and the number of assignments, so plug in. Make a = 51 to include the 5-point assignments and at least one 3-point assignment. The first 50 completed assignments earn 5 points each, for a total of (50)(5) = 250 points. The additional completed assignment earns 3 points. The total number of points earned for the 51 completed assignments is 250 + 3 = 253. This is the target value; write it down and circle it. Now plug a = 51 into the answer choices and eliminate any that do not match the target value. Choice (A) becomes g(51) = 3(51) + 5, then g(51) = 153 + 5, and finally g(51) = 158. This does not match the target value, so eliminate (A). Choice (B) becomes g(51) = 3(51) + 100, then g(51) = 153 + 100,

and finally $g(51) = 253$. This matches the target, so keep (B), but check the remaining answers just in case. Choice (C) becomes $g(51) = 3(51) + 250$, then $g(51) = 153 + 250$, and finally $g(51) = 403$; eliminate (C). Choice (D) becomes $g(51) = 8(51) – 150$, then $408 – 150$, and finally $g(51) = 258$; eliminate (D). The correct answer is (B).

22. **D**

The question asks for information that will provide proof of similar triangles. Use the Geometry Basic Approach. Triangles are similar when they have the same angle measures and proportional side lengths, so draw two triangles on the scratch paper that look similar but are different sizes. Then label the figures with information from the question: label *AB* as 22, *XY* as 11, and angles *A* and *X* as 77°. The drawing should look something like this:

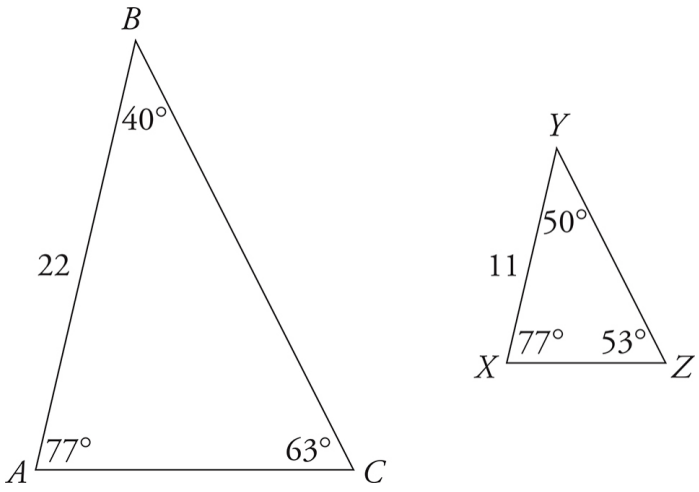


Next, evaluate the Roman numeral statements. They all give information about angles, so focus on the rule that similar triangles have the same three angle measures. The question only provides enough information to know that one angle measure is the same in both triangles, so more information is necessary; eliminate (A). Angle

measures alone do provide enough information if all three angles have the same measure, so eliminate (B).

Check the remaining answers one at a time to see whether one shows that all three angles have the same measure. Try (C), and label angle *B* as 40° and angle *Y* as 50°. Find the measure of the third angle in each triangle. All triangles contain 180°, so set up equations: 77° + 40° + *C*° = 180°, and 77° + 50° + *Z*° = 180°. Simplify the first equation to get 117° + *C*° = 180°, and then subtract 117° from both sides of the equation to get *C* = 63°. Simplify the second equation to get 127° + *Z*° = 180°, and then subtract 127° from both sides of the equation to get *Z* = 53°.

Label the figures with this information, and they now look like this:



The triangles do not have the same three angle measures, so they are not similar; eliminate (C). Try (D) and follow the same steps. Label angle *B* as 40° and angle *Z* as 63°. Angle *C* is again 63°. Solve for angle *Y*: 77° + *Y*° + 63° = 180°, 140° + *Y*° = 180°, and *Y*° = 40°. Label the triangles with this information to see that the triangles now have the same three angle measures. The correct answer is (D).