

PRACTICE TEST 2

Section 1: Reading and Writing

Module 1

TIME: 32 minutes for 27 questions.

DIRECTIONS: Read these passages and answer the questions that follow based on what is stated or implied in the passages and accompanying diagrams, charts, or graphs. Each question has one best answer.

1. Threatened species are plants and animals that are _____ become endangered within the foreseeable future throughout all or a significant portion of its range. According to the former Attorney General Loretta Lynch, “We all have a responsibility to protect endangered species, both for their sake and for the sake of our own future generations.”

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

- (A) definitely going to
 - (B) inevitably bound to
 - (C) probably able to
 - (D) likely to
2. It is important for clinical trials to have participants of _____ ages, sexes, races, and ethnicities. When research involves a group of people who are similar, the findings may not apply to or benefit everyone.

- (A) consistent
- (B) different
- (C) similar
- (D) conflicting

3. Hurricanes Irma and Maria highlighted the challenges for Federal agencies that rely on residential addresses to supply services in Puerto Rico. Relief efforts during the 2017 hurricane season were _____ by the absence of an island-wide system of addressing and the lack of physical addresses for approximately one-third of the island.

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

- (A) hampered
- (B) assisted
- (C) enhanced
- (D) enlightened

4. The following excerpt is adapted from *A Short History of the World* by H. G. Wells (1922).

The telescope reveals to us in various parts of the heavens luminous spiral clouds of matter, the spiral nebula, which appear to be in rotation about a center. It is _____ by many astronomers that the Sun and its planets were once such a spiral, and that their matter has undergone concentration into its present form.

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

- (A) ordered
 - (B) supposed
 - (C) undermined
 - (D) required
5. The rapidly rising river was another element of danger. It was a fearful sight to see the _____ flood plunging by, bearing great trees and logs of driftwood on its muddy surface many feet above the ground.

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

- (A) deceitful
- (B) placid
- (C) sluggish
- (D) relentless

6. The Box Tree Moth is an invasive pest that can significantly damage and potentially kill boxwood (*Buxus* species) plants if left unchecked. The insect is native to East Asia and has become a serious invasive pest in Europe, where it continues to spread. The caterpillars feed mostly on boxwood, and heavy infestations can _____ host plants. Once the leaves are gone, larvae consume the bark, leading to plant death.

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

- (A) defoliate
 - (B) embark
 - (C) empower
 - (D) engender
7. Non-chronological storytelling is not new to modern novels and films; in the *Odyssey*, for example, Homer uses flashbacks to _____ earlier scenes in Odysseus' adventures.

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

- (A) recount
- (B) reuse
- (C) reinstate
- (D) rescind

8. The following passage is adapted from an article on the USGS Volcano Hazards Program website.

USGS scientists monitor over 160 active and potentially active volcanoes in the United States. Most of these volcanoes are located in Alaska, a state where eruptions occur almost every year. The rest of the volcanoes are located throughout the American West, and in Hawaii. Since there are on average between 50 and 60 volcanoes that erupt each year somewhere on Earth (about one every week), some of Earth's volcanoes may actually erupt within a few days or hours of each other, possibly suggesting a cause-and-effect relationship between eruptions. Upon closer inspection, however, the eruptions are almost always preceded by very different build-up periods in terms of time (days to weeks to months to years) and type of activity (earthquakes, ground deformation, gas emissions, and small eruptions).

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

- (A) It states a hypothesis that is contradicted by evidence provided earlier in the text.
- (B) It presents a generalization that is exemplified by the discussion of the volcanoes in Hawaii.
- (C) It offers an alternative explanation to a speculative relationship referred to earlier in the text.
- (D) It provides context that clarifies why volcanoes are preceded by different build-up periods.

9. The following is an excerpt from a National Institutes of Health article titled “Genetics.”

All living things evolved from a common ancestor. Therefore, humans, animals, and other organisms share many of the same genes, and the molecules made from them function in similar ways.

Scientists have found many genes that have been preserved through millions of years of evolution and are present in a range of organisms living today. They can study these preserved genes and compare the genomes of different species to uncover similarities and differences that improve their understanding of how human genes function and are controlled. This knowledge helps researchers develop new strategies to treat and prevent human disease. Scientists also study the genes of bacteria, viruses, and fungi for solutions to prevent or treat infection. Increasingly, these studies are offering insight into how microbes on and in the body affect our health, sometimes in beneficial ways.

Which choice poses a question that can be answered by the information in the text?

- (A) Why do scientists study the genes of organisms other than human beings?
- (B) What genes do humans share with bacteria, fungi, and viruses?
- (C) How do genes function to treat and prevent human disease?
- (D) How do researchers preserve the genes of organisms that no longer exist today?

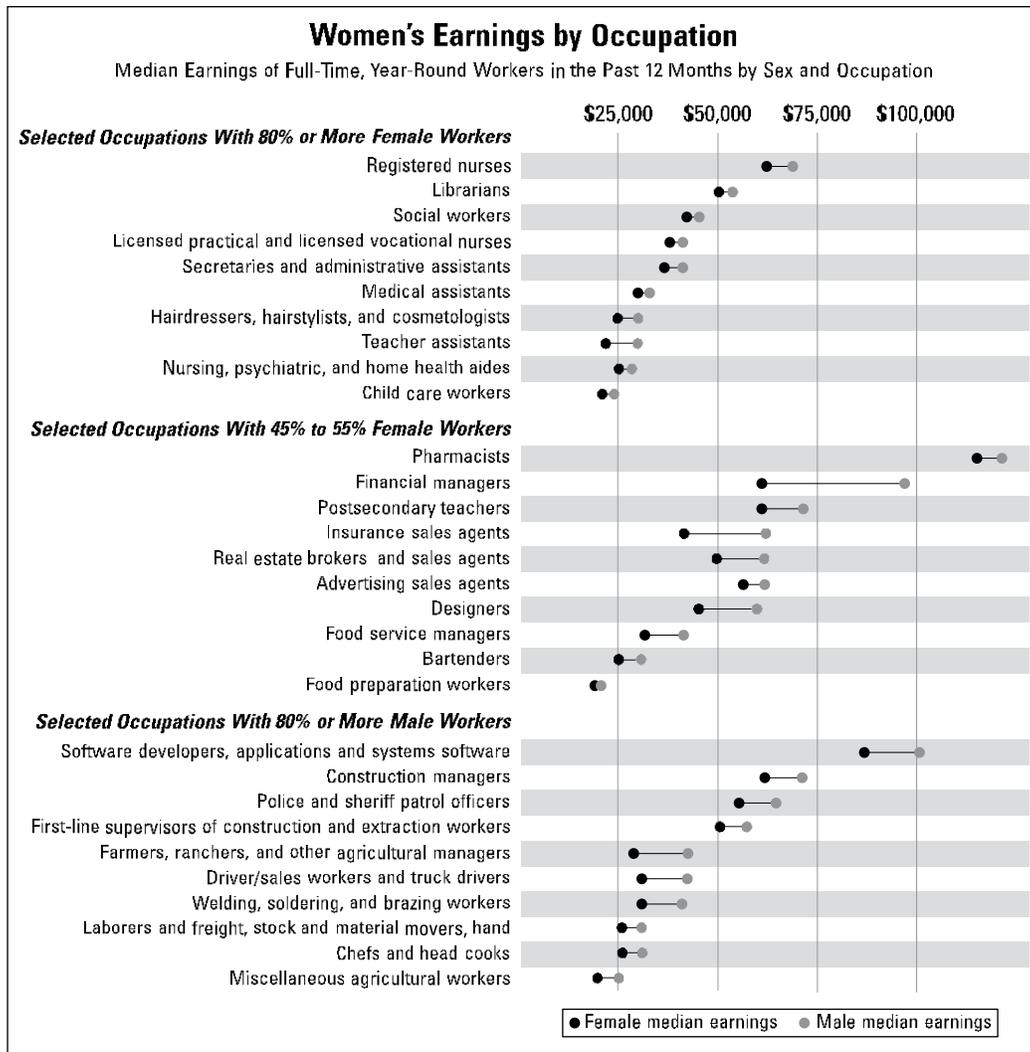
10. To get a grasp of the complex interactions between living things, we can start by looking at a simple linear food chain: sun, dandelion, rabbit, and hawk. Sunlight is converted into chemical energy by green plants. Part of that energy is captured by herbivorous insects and vertebrates when they eat the plants. Carnivores then eat herbivores. In reality, however, the flow of energy through an ecosystem is more like a web. Species share energy back and forth in subtle ways. If we consider other relationships (for example, plants that provide cover and nesting habitats to animals; insects, birds, and bats that pollinate flowers; rodents that disperse seeds; animals that require shade created by plants; and so on), our web approaches a symbol of what nature is really like.

Which choice best explains the difference between a linear and a web-like representation of the food chain?

- (A) A linear representation expresses a more complex relationship while a web representation expresses a simpler relationship.
- (B) A linear representation expresses an inorganic relationship while a web representation expresses an organic relationship.
- (C) A linear representation expresses a non-human relationship while a web representation expresses a human-to-human relationship.
- (D) A linear representation expresses a relationship in a straight line while a web representation expresses a multi-directional relationship.

11. The gender pay gap is greater for women in certain sectors. For example, in the following graph, among workers who were self-employed, women earned an estimated 69 cents for every dollar earned by men. In private, for-profit companies, women earned an estimated 78 cents for every dollar earned by men. In government agencies and non-profit organizations, women earned an estimated 85 cents for every dollar earned by

men. The gender pay gap also varied by level of education. For example, among workers — including both full-time and part-time workers — with less than a high school diploma, women earned an estimated 66 cents for every dollar earned by men. Among workers with a bachelor’s degree, women earned an estimated 70 cents for every dollar earned by men.



Source: 2015, American Community Survey/ with permission of U.S. Department of Commerce.

Which choice most effectively uses data from the chart that supports information in the text?

- (A) Postsecondary female teachers had a higher median income than that of male chefs and head cooks.
- (B) Male truck drivers had a higher median income than that of female child care workers.

(C) Except in the field of education, females earned less than males in every occupation listed on the graph.

(D) The smallest salary gap between males and females was in financial management occupations.

12. Table 1.1 Time taken to add each billion to the world population, 1800–2046 (projection)

Date	Estimated world population (billions)	Years to add 1 billion people
1800	1	2,000,000
1930	2	130
1960	3	30
1974	4	14
1987	5	13
1999	6	12
2011	7	12
2024 (projected)	8	13
2046 (projected)	9	22

Source: Adapted from Population Division

Which choice most effectively uses data from the chart to complete the sentence?

According to the data on the chart, as the estimated world population increases, the number of years estimated to add 1 billion people _____.

- (A) decreases sharply
- (B) decreases and then increases slightly
- (C) increases sharply
- (D) increases and then decreases slightly

13. The following excerpt is adapted from *The Wiley-Blackwell Companion to Sociology*, edited by George Ritzer (Wiley-Blackwell).

Ritzer (2009) has recently argued that the focus on either production or consumption has always been misplaced and that all acts always involve both. That is, all acts of production and consumption are fundamentally acts of “prosumption.” The assembly-line worker is always consuming all sorts of things (parts, energy, tools) in the process of production, and conversely the consumer in, for example, a fast-food restaurant is always producing (garnishes for a sandwich, soft drinks from the self-serve dispenser, the disposal of debris derived from the meal). This suggests a dramatic reorientation of theorizing about the economy away from production or consumption and in the direction of “prosumption.”

According to the text, what does Ritzer argue is the difference between production and consumption?

- (A) Production is creating, and consumption is using.
- (B) Production is recent, and consumption is historical.
- (C) Production is permanent, and consumption is temporary.
- (D) They are opposite sides of the same spectrum.

14. The following poem was written by American poet Walt Whitman (1868).

A noiseless patient spider,
I mark'd where on a little promontory it stood
isolated,
Mark'd how to explore the vacant vast sur-
rounding,
It launch'd forth filament, filament,
filament, out of itself,
Ever unreeling them, ever tirelessly speeding
them.

And you O my soul where you stand,
Surrounded, detached, in measureless oceans
of space,
Ceaselessly musing, venturing, throwing,
seeking the spheres to connect them,
Till the bridge you will need be form'd, till the
ductile anchor hold,
Till the gossamer thread you fling catch
somewhere, O my soul.

Which of the following best describes the structure of the poem?

- (A) The first stanza is metaphorical, and the second stanza is literal.
 - (B) The first stanza admires the spider, and the second stanza reviles the spider.
 - (C) The first stanza is literal, and the second stanza is philosophical.
 - (D) The first stanza presents the spider as repulsive, and the second stanza personifies the spider.
15. The following passage is adapted from the *Library of the Best American Literature*, by William W. Birdsall and Rufus M. Jones (1897).

In his personality, his wide range of themes, his learning, and his wonderful power of telling stories in song, Henry Wadsworth Longfellow stood in his day and still stands easily in front of all other poets who have enriched American literature. Admitting that he was not rugged and elemental like Bryant and did not possess the latter's feelings for the colossal features of wild scenery, that he was not profoundly thoughtful and transcendental like Emerson, that he was not so earnestly and passionately sympathetic as Whittier, nevertheless he was our first artist in poetry. Bryant, Emerson, and Whittier commanded but a few stops of the grand instrument upon

which they played; Longfellow understood perfectly all its capabilities.

Which choice best describes the function of the underlined sentence in the text as a whole?

- (A) It anticipates a possible criticism of Longfellow and answers it with a bold declaration.
 - (B) It affirms qualities that dismiss Longfellow from the ranks of great American poets.
 - (C) It provides specific examples to illustrate Longfellow's superiority to Bryant in depicting wild scenery.
 - (D) It illustrates a unique transcendent quality of Longfellow's poetry.
16. The following passage is an excerpt from *GRE For Dummies*, 8th edition, by Ron Woldoff and Joe Kraynak (Wiley).

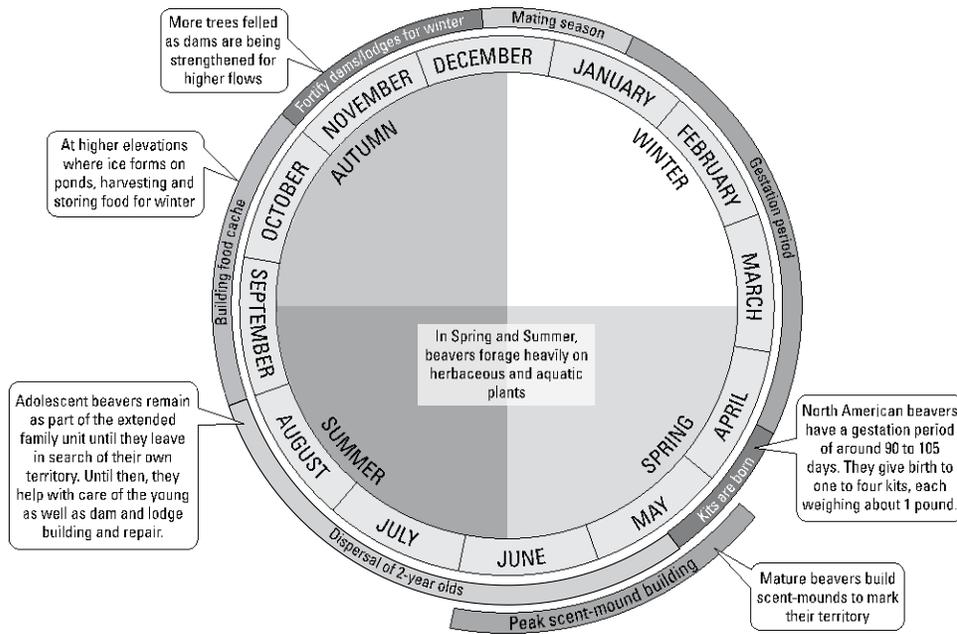
A key study has shown that the organic matter content of a soil can be altered to a depth of 10 cm or more by intense campfire heat. As much as 90 percent of the original organic matter may be oxidized in the top 1.3 cm of soil. In the surface 10 cm, the loss of organic matter may reach 50 percent if the soil is dry and the temperature exceeds 250 degrees. The loss of organic matter reduces soil fertility and water-holding capacity and renders the soil more susceptible to compaction and erosion.

Which of the following best describes the function of the underlined sentence in the text as a whole?

- (A) It elaborates on an example of organic matter as a measure of soil fertility.
- (B) It explains the methodology used to determine soil fertility and water-holding capacity.
- (C) It calls attention to the harmful effects of a common occurrence in campgrounds.
- (D) It offers a solution to an unfortunate result of the increase in the popularity of camping.

17.

YEARLY CYCLE of Western Washington Beavers



Source: King County / Public Domain

The following excerpt was adapted from *Planning for Beavers Manual: Anticipating Beavers when Designing Restoration Projects*, King County, Washington.

Land managers throughout the Puget Sound region are investing large sums of money and other resources to improve salmon habitat in streams and rivers. In the last 15 years, King County ecologists and land managers have seen a pattern of beavers colonizing these restoration sites anywhere from immediately to within 2 to 5 years of finishing a restoration project. Frequently, the beavers extensively browse newly planted vegetation. They have also built dams at some sites that flooded adjacent properties. Beaver colonization is now expected following construction of restoration projects along streams and rivers in King County, where restoration sites are usually also close to roads, culverts, farms, orchards, lawns, and houses. At the end of the summer,

Which choice most effectively uses information from the graphic and the text to complete the sentence?

- (A) beavers begin their mating season and mark their territory in preparation for giving birth.
- (B) beavers build scent-mounds around the perimeter of their territory to indicate that a certain location is spoken for.
- (C) properties located near beaver colonies will experience an increase in flooding as adolescent beavers join dam-building efforts.
- (D) newly planted vegetation will flourish as beavers enter a period of hibernation and consume less food than usual.

18. Passage 1 is an excerpt from *Novel Plant Biore-sources* by Gurib Fakim (Wiley). Passage 2 is an excerpt from *Biology For Dummies, 2nd Edition*, by Rene Kratz and Donna Siegfried (also published by Wiley).

Text 1

The loss in biodiversity could have effects beyond just the loss of individual species. Living things are connected to each other and their environment in how they obtain food and other resources necessary for survival. If one species depends on another for food, for example, then the loss of a prey species can cause a decline in the predator species.

Text 2

Biodiversity increases the chance that at least some living things will survive in the face of large changes in the environment, which is why protecting it is crucial. The combined effect of various human actions in Earth's ecosystems is reducing the planet's biodiversity. In fact, the rate of extinctions is increasing along with the size of the human population. No one knows for certain how extensive the loss of species due to human impacts will ultimately be, but there's no question that human practices such as hunting and farming have already caused numerous species to become extinct.

With which of the following statements would both the writer of Text 1 and the writer of Text 2 agree?

- (A) Reliance on a small number of food sources is a problem now and may become more severe in the future.
- (B) Extinction of species is a naturally occurring process and is independent of human intervention.
- (C) The key to maintaining an adequate food supply is reducing the planet's biodiversity.
- (D) Reducing the number of predator species is crucial to protecting human food supplies.

19. A century ago, a bird called the passenger pigeon lived in North America. There were so many passenger pigeons that people often saw great flocks of _____ overhead containing thousands, even millions, of birds. Today, there is not a single one left. What happened? The passenger pigeon became extinct. All living passenger pigeons disappeared from the earth entirely.

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

- (A) those who were
(B) them flying
(C) they were flying
(D) whom were able to fly

20. At the end of each year, a revised figure of U.S. population estimates _____ to update the short-term projections for the population clock. Once the updated series of monthly projections is completed, the daily population clock values are derived by interpolation. Within each calendar month, the daily numerical population change is assumed to be constant, subject to negligible differences caused by rounding.

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

- (A) are used
(B) is used
(C) are being used
(D) used

21. English Gothic architecture has been usually subdivided into three periods or stages of _____ early stage, occupying the 13th century, is known as Early English.

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

- (A) advancement, the
(B) advancement; in the
(C) advancement in the
(D) advancement: The

22. Polar bears' seasonal movements are driven by regional ice dynamics and can be quite extensive. Most polar bears remain with the pack ice as it recedes north during the summer melting season; _____ along Alaska's Beaufort Sea coast, some polar bears also come on land to rest until shore-fast ice begins to develop along the coast in late fall and the pack ice advances south, once again providing them with a suitable platform for hunting seals.

Which choice completes the text with the most logical transition?

- (A) however,
- (B) similarly,
- (C) consequently,
- (D) moreover,

23. Charlie hated driving home in a snowstorm. He was afraid his vision was impaired by the blowing snow and the wildly waving windshield wipers. Then, his worst fears were realized. While taking a few seconds to clean his glasses, _____ skidded off the highway.

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

- (A) his car suddenly lurched to the left and
- (B) Charlie's car suddenly swerved and
- (C) his heart pounded wildly as he
- (D) Charlie had to clutch the wheel quickly as his car

24. The rivalry between tennis great Monica Seles and Stefi Graf began at the French Open Tournament in 1989. Their match in the semifinals _____ eagerly watched by fans all over the world. Monica Seles was only 16 years old; Stefi Graf had the advantage in years and experience, and her wins in their first few matches established her strength. It was in their fourth encounter that Seles finally defeated the more established Graf.

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

- (A) were
- (B) is
- (C) was
- (D) are

25. The Nez Percé National Historic Trail ranges from the _____ incised Columbia River Plateau, across the Continental Divide and a succession of ranges, canyons, and valleys, through forests and plains, across thermal areas and major rivers. The Trail winds through some of the most rugged and spectacular scenery in western America. It traverses some of the largest undisturbed tracts of sagebrush steppe habitat, and a tremendous variety of wildlife and plant species thrive across the varied habitats of the Trail corridor.

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

- (A) deeply
- (B) deep
- (C) deeper
- (D) deepest

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

- An organism’s complete set of DNA is called its genome. Virtually every single cell in the body contains a complete copy of the approximately 3 billion DNA base pairs, or letters, that make up the human genome.
- With its four-letter language, DNA contains the information needed to build the entire human body. A gene traditionally refers to the unit of DNA that carries the instructions for making a specific protein or set of proteins.
- The human genome is a complete set of nucleic acid sequences for humans, encoded as DNA within the 23 chromosome pairs in cell nuclei and in a small DNA molecule found within individual mitochondria.
- Unlocking the genetic code allows scientists to assess an individual’s genetic susceptibility to specific diseases, to diagnose genetic disorders, and to formulate new drugs.
- Proteins make up body structures like organs and tissue, as well as control chemical reactions and carry signals between cells. If a cell’s DNA is mutated, an abnormal protein may be produced, which can disrupt the body’s usual processes and lead to a disease such as cancer.

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) Each of the estimated 20,000 to 25,000 genes in the human genome codes for an average of three proteins.
- (B) Understanding the structure and function of DNA and unlocking an individual’s genetic code has helped scientists revolutionize the investigation of disease pathways.
- (C) Abnormal proteins caused by mutated DNA can be the source of life-threatening diseases such as cancer.
- (D) By mapping the human genome, scientists can obtain a complete set of nucleic acid sequences.

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

River Name	Countries	Outlet	Length in Miles
Amazon	Peru, Brazil	Atlantic Ocean	3,900
Congo	Zaire, Congo, Angola	Atlantic Ocean	3,900
Missouri-Mississippi	U.S.	Gulf of Mexico	3,990
Nile	Uganda, Sudan, Egypt	Mediterranean Sea	4,160
Huang He (Yellow R.)	China	Gulf of Bohai	2,800

The student wants to compare the lengths of the two longest rivers. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- (A) While the Nile River in Egypt, Uganda, and Sudan is the longest river in the world, the Huang He River empties into the Gulf of Bohai.
- (B) The five longest rivers in the world are the Amazon, the Congo, the Missouri-Mississippi, the Nile, and the Huang He.
- (C) Of the five longest rivers in the world, two have their outlets in the Atlantic Ocean, while three others have their outlets in smaller bodies of water.
- (D) At 4,160 miles, the longest river in the world is the Nile River, while the Missouri-Mississippi in the U.S. is the second longest at 3,990 miles long.

Check Your Work.

Continue to the next module when you’re ready to move on.

Module 2

TIME: 32 minutes for 27 questions.

DIRECTIONS: Read these passages and answer the questions that follow based on what is stated or implied in the passages and accompanying diagrams, charts, or graphs. Each question has one best answer.

1. The paintings of Salvador Dali, the renowned surrealist artist, are immediately recognizable for their bizarre images and technical precision. He created highly personal paintings that broke with tradition and _____ optical illusions.

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

- (A) featured
- (B) overwhelmed
- (C) discredited
- (D) renewed

2. Two particularly useful _____ of the timing of spring events are the first leaf dates and the first bloom dates of two flowering plants: lilacs and honeysuckles. These plants have an easily monitored flowering season, a relatively high survival rate, and a large geographic distribution.

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

- (A) effects
- (B) varieties
- (C) species
- (D) indicators

3. Eighteenth-century stories of the strange appearance and behavior of an unidentified creature left naturalists _____ as to what could fit its seemingly catch-all characteristics. The strange animal captured the imagination of scientists who did not know how to classify the duck-billed platypus. We now know that the platypus is a monotreme, an ancient type of mammal that lays eggs.

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

- (A) mystified
- (B) delighted
- (C) settled
- (D) confident

4. Comparative genomics is directly related to evolution because all living things share a common ancestor. By using computer tools to examine genes that have remained the same in many organisms over millions of years, researchers can _____ signals that control how genes work.

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

- (A) disrupt
- (B) locate
- (C) question
- (D) influence

5. The Antiquities Act of 1906 was inspired by the need to _____ ancient American Indian ruins in the southwestern United States during the 19th-century push to open the country's western frontier. One hundred years after its enactment, the Antiquities Act remains one of the nation's most important conservation laws.

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

- (A) raze
- (B) reconfigure
- (C) safeguard
- (D) complete

6. The rather pedestrian plot of the film was elevated by its _____ cinematography; the magnificent panoramas of the African veldt were photographed in stunning clarity and breathtaking beauty.

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

- (A) ordinary
- (B) abundant
- (C) exquisite
- (D) banal

7. The following excerpt is adapted from *Punch*: Volume 118, Nos. 3052–3077.

“Assuredly,” I said. “We don’t take enough advice, in my opinion — just as we don’t take enough exercise or wholesome food. It is too much the fashion to ask advice and not take it. But if we modelled our lives on the disinterested opinion of other people, and availed ourselves of the combined judgment of our fellows, the world would be both happier and wiser in many directions. And if men knew when they were invited to express an opinion that it was no mere conventional piece of civility or empty compliment which prompted us to ask their criticism, consider how they would put their best powers forward.”

Which of the following best expresses the primary claim of the speaker in the passage?

- (A) It is far healthier to follow one’s personal inclination than to accept the opinions of others.
- (B) The primary qualities that allow society to function are civility and good judgment in interpersonal interactions.
- (C) Advice that is not requested should never be offered.
- (D) Our lives would be improved if we were to seek and heed the objective opinions of others.

8. The following excerpt is from *Bedouins* by James Huneker (1920).

Some years ago in Paris I saw and heard Mary Garden sing *La Traviata*. The singing was superlative; she then boasted a coloratura style that would surprise those who now only know her vocalization. It was, however, the conception and acting that intrigued me. Originality stamped both. The death scene was of unusual poignancy; evidently the young American had been spying upon Bernhardt and Duse.*

*Sarah Bernhardt and Eleonora Giulia Amalia Duse were famous actresses of the late 19th century.

Which choice best states the function of the underlined sentence in the overall structure of the text?

- (A) To offer a criticism of the singer’s performance
- (B) To provide objectivity to an analysis of the singer’s acting ability
- (C) To indicate the qualities that fascinated the writer
- (D) To praise the coloratura style of the singer

9. The following text is adapted from *Democracy in America* by Alexis de Tocqueville (1835).

The settlers who established themselves on the shores of New England all belonged to the more independent, knowledgeable, and skilled classes of their native country. Their union on the soil of America at once presented the singular phenomenon of a society containing neither lords nor common people, neither rich nor poor. These men possessed, in proportion to their number, a greater mass of intelligence than is to be found in any European nation of our own time. All, without a single exception, _____.

Which choice most logically completes the text?

- (A) had received a good education, and many of them were known in Europe for their talents and their acquirements.
 - (B) belonged to the aristocracy and thus had been provided with the best tutors and instructors.
 - (C) had been either indentured servants in Europe or had been poor, so the New World offered them the opportunity to escape a life of servitude.
 - (D) had a natural affinity for the menial jobs required by the new settlements and put their physical prowess to good use as they attempted to carve a home out of the wilderness.
10. The following text is an excerpt from *A Brief History of the Olympic Games* by David C. Young (Wiley).

“Victory by speed of foot is honored above all.” Those are the words of Xenophanes, a 6th century b.c.e. philosopher who objected to athletes and their popularity. The phrase “speed of foot” may recall the words expressed in Homer’s *Odyssey* stressing the glory which an athlete may win “with his hands or with his feet.” The shortest foot race, the stade, was one length of the stadium track, the practical equivalent of our 200-meter dash (actually, only 192.27 meters at Olympia, the site of the original Olympic games). Greek tradition held that this 200-meter race was the first and only event held at the first Olympiad in 776 b.c.e.

Which of the following best states the purpose of the quotations in the text?

- (A) To offer conflicting opinions
 - (B) To establish an authoritative tone
 - (C) To invite the reader to conduct further research
 - (D) To give a sense of Greek literary style
11. The following passage is adapted from the *Library of the Best American Literature*, by William W. Birdsall and Rufus M. Jones (1897).

As a poet Poe ranks among the most original in the world. He is preeminently a poet of the weirdness, subtlety, artistic detail and facility in coloring which give the charm to his prose stories, and to these he adds a musical flow of language which has never been equalled. To him poetry was music, and there was no poetry that was not musical. For poetic harmony he has had no equal certainly in America, if, indeed, in the world. Admirers of his poems are almost sure to read them over and over again, each time finding new forms of beauty or charm in them, and the reader abandons himself to a current of melodious fancy that soothes and charms like distant music at night, or the rippling of a nearby, but unseen, brook. As one of his biographers has written, _____

Which of the following quotations most logically and effectively completes the text?

- (A) “I never heard a voice so musical as his. It was full of the sweetest melody. No one who heard his recitation of the ‘Raven’ will ever forget the beauty and pathos with which this recitation was rendered.”
- (B) “The images which he creates are vague and illusive.”
- (C) “The artful ingenuity with which he works up the details of his plot, and minute attention to the smallest illustrative particular, give his tales a vivid interest from which no reader can escape.”
- (D) “The scenes of gloom and terror which he loves to depict, the forms of horror to which he gives almost actual life, render his mastery over the reader most exciting and absorbing.”

12. The following passage is adapted from *A Practical Guide to Scientific Data Analysis* by David J. Livingstone (Wiley-Blackwell).

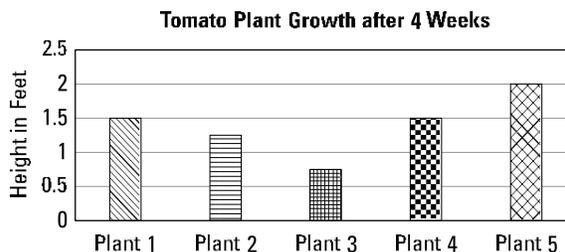
Statistics is often concerned with the treatment of a small number of samples which have been drawn from a much larger population. Each of these samples may be described by one or more variables which have been measured or calculated for that sample. For each variable there exists a population of samples. It is the properties of populations of variables that allow the assignment of probabilities, for example, _____

Which choice completes the text with the most logical example?

- (A) all the characteristics of the sample that remain constant throughout the population.
 - (B) the total number of a population from which the samples have been chosen.
 - (C) the likelihood that the variable will fall into a particular range and the assessment of significance.
 - (D) the exact number of all the occurrences of a particular set of circumstances within a population.
13. Mr. Burns, concerned about the growth of his tomato plants in his garden, decides to conduct an experiment to test several recommended fertilizers to determine which one, if any, he should use to protect his plants from infestation. He uses three different fertilizers on his plants and measures them after four weeks to determine the most effective fertilizer. At the end of four weeks, Mr. Burns is pleased with the growth of Plant 5 but is puzzled by the results for Plant 3.

Fertilizers:

- A, Potassium
- B, Nitrogen + Potassium
- C, Nitrogen + Phosphorous



Plant Number	Fertilizer Used
Plant 1	B
Plant 2	A
Plant 3	C
Plant 4	B
Plant 5	C

Which of the following would explain the discrepancy in the results of Mr. Burns' experiment?

- (A) Mr. Burns used an automatic watering system that ensured the tomato plants received water at 5:00 a.m. and 5:00 p.m. each day.
- (B) Mr. Burns planted the tomatoes in five different areas of his yard to protect them from overcrowding.
- (C) Mr. Burns purchased tomato plants identical in size and type of tomato at the beginning of his experiment.
- (D) Mr. Burns applied the fertilizer once a week in equal quantities.

14. The following passage is an excerpt from *Biology For Dummies, 2nd Edition*, by Rene Fester Kratz, PhD, and Donna Rae Siegfried (Wiley).

The cuticle is a layer of cells found on the top surfaces of a plant's leaves. It lets light pass into the leaf but protects the leaf from losing water. Many plants have cuticles that contain waxes that resist the movement of water into and out of a leaf, much like wax on your car keeps water off the paint. Guard cells are found on the bottom of a plant's leaves, near a stomate, a tiny opening that you can't see with your naked eye. (An individual opening is called a stomate, or stoma; several openings are called stomates, or stomata.)

Which of the choices describes the function of the underlined portion of the text?

- (A) It clarifies a function by using an analogy.
 - (B) It refutes an assertion in the first part of the sentence.
 - (C) It provides an example that is expanded upon in the next sentence.
 - (D) It indicates another function of the cuticle layer of cells in a plant.
15. The following passage is adapted from *Dendroclimatic Studies: Tree Growth and Climate Change in Northern Forests*, by Rosanne D'Arrigo, Nicole Davi, Gordon Jacoby, Rob Wilson, and Greg Wiles (Wiley-Blackwell).

The science of dendroclimatology evolved from the need to understand past and present climate variability as well as the factors impacting tree growth and climate response on a range of spatial and vascular scales. Determination of how climate has varied in the past is also critically important for evaluating the sensitivity of the Earth's climate system to both natural and anthropogenic forces. Yet instrumental observations are limited in length and spatial coverage, particularly in many remote, far-northern regions, where station records may only span a few decades. Overcoming these limitations requires high-resolution, precisely dated proxy data archives, like tree rings, so that we may derive a long-term perspective for conditions during the recent anthropogenic era, during which profound and rapid changes are now taking place.

Which of the choices describes the function of the underlined portion of the text?

- (A) It summarizes the results of a study.
 - (B) It offers an example of how observations can assist by providing eyewitness evidence.
 - (C) It describes a shortcoming of a method of scientific investigation.
 - (D) It presents a central finding in the science of dendroclimatology.
16. The following is an excerpt from *Life on the Mississippi* by Mark Twain (1883). The writer is recalling the time he spent as an assistant pilot on a steamboat.

Now when I had mastered the language of this water and had come to know every trifling feature that bordered the great river as familiarly as I knew the letters of the alphabet, I had made a valuable acquisition. But I had lost something, too. I had lost something which could never be restored to me while I lived. All the grace, the beauty, the poetry had gone out of the majestic river! I still keep in mind a certain wonderful sunset which I witnessed when steamboating was new to me. A broad expanse of the river was turned to blood; in the middle distance the red hue brightened into gold, through which a solitary log came floating, black and conspicuous; in one place a long, slanting mark lay sparkling upon the water; in another the surface was broken by boiling, tumbling rings, that were as many-tinted as an opal . . .

Which choice best states the main idea of the text?

- (A) The writer is training to become a pilot because he wants to spend his days simply appreciating nature.
- (B) The writer has gained technical knowledge of the river as a pilot but has lost an appreciation of its beauty.
- (C) The beauty of the river hides a danger that an unsuspecting pilot might miss.
- (D) Now that he has spent more time on the river, the writer is inspired to create a poem about his steamboat travels.

17. An automobile starts from rest and travels along a straight road. Point A is the starting point; Point E is the stopping point.

Points	Time Elapsed in Minutes	Distance Traveled in Feet
A Start	2	20
B	4	50
C	5	70
D	6	90
E Stop	9	100

Which of the following choices is true based on the information in the chart?

- (A) During Interval B – C, the automobile is traveling at a constant speed.
- (B) The automobile travels the farthest during Interval C – D.
- (C) At the end of Interval D – E, the automobile is both stationary and farthest from the starting point.
- (D) The automobile travels at the greatest speed during Interval A – B.

18. A conservation botanist studied the plants growing in an abandoned field. Once a year for 3 years, they checked the number of plants of each variety. Their results are indicated in the chart below.

Year	Number of Plants per Acre				
	Winter Bentgrass	Purple Lovegrass	Little Bluestem	Path Rush	Canada Goldenrod
1	2,600	3,980	450	395	2
2	1,100	1,890	1,970	990	805
3	698	127	2,380	1,100	1,750

Which choice is supported by the information in the chart?

- (A) Little Bluestem and Canada Goldenrod compete with one another for resources.
 - (B) All the plants are negatively impacted by climate change.
 - (C) Little Bluestem and Path Rush have similar life spans.
 - (D) Plant populations are replacing one another.
19. Listening to _____ about flight delays, inaccurate train schedules, poorly maintained rental cars, and unsafe pedestrian pathways, it is rather tempting to stay home and cuddle up on the couch with a good book.
- Which of the following completes the text so that it conforms to the conventions of Standard English?
- (A) traveler’s stories’
 - (B) travelers’ stories
 - (C) travelers stories
 - (D) travelers’ story’s
20. *Inherit the Wind*, a play by Jerome Lawrence and Robert E. Lee, is a fictionalized account of the Scopes “Monkey” trial in which the famous _____ “what happened in a school-room of your town has unloosed a wicked attack from the big cities of the North!”
- Which of the following completes the text so that it conforms to the conventions of Standard English?
- (A) attorney, Matthew Brady, claims to have come because,
 - (B) attorney Matthew Brady claims to have come because
 - (C) attorney, Matthew Brady, claims to have come because
 - (D) attorney, Matthew Brady claims to have come, because

- 21.** The following passage is adapted from *The Life of Ludwig van Beethoven* by Alexander Wheelock Thayer (1921).

It is a family tradition that Louis van Beethoven, owing to some financial difficulties, secretly left his father's house at an early age and never saw it again. Gifted with a good voice and well educated musically, _____ and applied for a vacant position as tenor, receiving it on November 2, 1731. A few days later the young man of 18 years was appointed substitute for three months for the singing master who had fallen ill.

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

- (A) it was the city of Louvain he first went to
- (B) the city of Louvain was where he went
- (C) Louvain was the destination where he went
- (D) he first went to the city of Louvain

- 22.** The following was adapted from an article titled "Women in the Civil Rights Movement Historic Context Statement and AACRN Listing Guidance" on the National Park Service website.

Septima Poinsette Clark, the daughter of a formerly enslaved father and a free-born mother, was born in 1898 and raised in Charleston, South Carolina. After graduating from the Avery Normal Institute in 1916, Clark began her career as a teacher. Black teachers were not allowed to teach in the Charleston public schools _____ found themselves teaching in rural, underfunded schools. After Clark joined the Charleston branch of the National Association for the Advancement of Colored People (NAACP), she began to get more involved in social justice issues. Clark and other schoolteachers created a campaign to protest the discrimination they faced. Their campaign was successful, and they gained the right to teach at public schools in Charleston.

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

- (A) system, though; most
- (B) system, though, most
- (C) system; though. Most
- (D) system, though most,

- 23.** Adult monarch butterflies are large and conspicuous, with bright orange wings surrounded by a black border and covered with black veins. The black border has a double row of white spots, present on the upper side of the wings. Adult monarchs are sexually dimorphic, with males having a narrower arrangement of veins and scent patches. The bright coloring of a monarch serves _____ to predators that eating them can be toxic.

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

- (A) to warn
- (B) as a warning
- (C) by warning
- (D) and it is a warning

- 24.** Consumers are eagerly leasing and purchasing electric cars because these cars cause no air pollution, make little or no noise, and _____.

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

- (A) gas is not used for fuel.
- (B) they aren't using gas for fuel.
- (C) use no gas.
- (D) they don't use gas.

- 25.** The birds of New Zealand had no natural _____ wings became unnecessary, and many varieties, including the kiwi and the kakapo parrot, became flightless.

Which of the following completes the text with the most logical transition?

- (A) predators, when
- (B) predators, but,
- (C) predators; therefore,
- (D) predators; nonetheless,

26. The following was adapted from an article titled “History & Culture” on the National Park Service website.

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

- With the support of many early conservationists, scientists, and other advocates, Everglades National Park was established in 1947 to conserve the natural landscape and prevent further degradation of its land, plants, and animals.
- The shallow, slow-moving sheet of water in South Florida covered almost 11,000 square miles, creating a mosaic of ponds, sloughs, sawgrass marshes, hardwood hammock, and forested uplands.
- From the sawgrass prairies to pine rocklands to mangrove forests to towering palms to open marine waters, Everglades is home to many diverse ecosystems, each with their own unique features and associated plants and wildlife, including a variety of threatened and endangered species.
- A long-standing wildlife monitoring program in Everglades National Park has provided information critical to the management of wading birds, eagles and ospreys, sea turtles, alligators and crocodiles, white-tailed deer, and the Cape Sable seaside sparrow.
- Many unique reptiles inhabit the park, including a variety of turtles, snakes, alligators, crocodiles, and lizards.

The student wants to explain why the Everglades National Park is such a captivating attraction to tourists, conservationists, plant enthusiasts, animal lovers, and so many others.

Which choice effectively uses relevant information to accomplish that goal?

- (A) The shallow, slow-moving sheet of water in South Florida covered almost 11,000 square miles, creating a mosaic of ponds, sloughs, sawgrass marshes, hardwood hammock, and forested uplands.
- (B) Much of the appeal of the Everglades in South Florida stems from its unique ecosystem, with its endless marshes, dense mangroves, towering palms, and tropical fauna like alligators, crocodiles, manatees, and lizards.
- (C) Various groups and people navigated through and wrestled with the watery landscape to make it home, and even to exploit its resources.
- (D) For thousands of years, this intricate system evolved into a finely balanced ecosystem that formed the biological infrastructure for the southern half of the state.

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

- Asthma is a disease that affects the lungs, and causes wheezing, breathlessness, chest tightness, and coughing.
- About 8 percent of white children in the U.S. suffer from asthma.
- From 2018–2020, 4.0 million non-Hispanic Blacks (adults and children) reported that they currently have asthma.
- Blacks and American Indian/Alaska Natives have the highest current asthma rates compared to other races and ethnicities. In 2018, Blacks (10.9 percent) were 42 percent more likely than Whites (7.7 percent) to still have asthma, and 14.5 percent of Black children have been diagnosed with asthma.
- The percentage of children in the U.S. with asthma doubled in the 1980s and 1990s and has been increasing steadily since then. The reason for the increase has remained mysterious, but there may be many possible factors, including exposure to secondhand smoke, obesity, and children’s immune systems failing to develop properly.
- Non-Hispanic Black children were 4.5 times more likely to be admitted to the hospital for asthma, as compared to non-Hispanic White children, in 2019.

The student wants to compare the prevalence of asthma in children based on race. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- (A)** The reasons for the increase in childhood asthma are unknown, but race is clearly a factor as almost twice as many Black children (14.5 percent compared to 8 percent of White children) report that they currently have asthma.
- (B)** While explanations for the increase in asthma remain inconclusive, Black children are more likely than White children to be hospitalized.
- (C)** The percentage of U.S. children with asthma, a disease that affects the lungs, doubled in the 1980s and 1990s and had been increasing steadily since then.
- (D)** Some researchers attribute the rise in childhood asthma to pollutants in the air, unhealthy diets, and poorly developed immune systems.

Check Your Work.

Continue to the next module when you’re ready to move on.

Section 2: Math

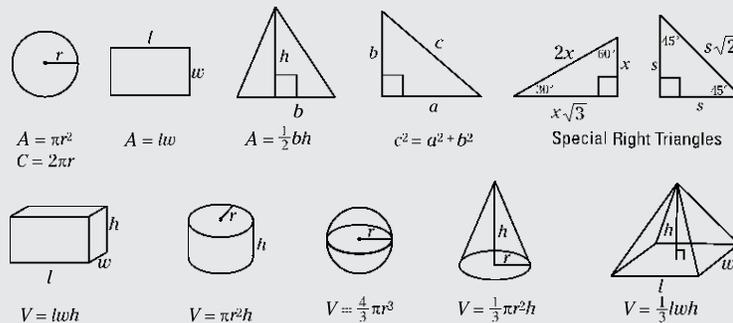
Module 1

TIME: 35 minutes for 22 questions.

DIRECTIONS: For multiple-choice questions, choose only one answer for each question. For fill-in questions, write only one answer, even if you find more than one correct answer. Don't include symbols such as a percent sign, comma, or dollar sign.

NOTES:

- All numbers used in this exam are real numbers.
- All figures lie in a plane.
- All figures may be assumed to be to scale unless the problem specifically indicates otherwise.
- The domain of a given function f is the set of all real numbers x for which $f(x)$ is a real number, unless the problem specifically indicates otherwise.
- You may use a calculator.



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

1. If $2a + 3b = 17$ and $2a + b = 3$, then $a + b =$

- (A) 1
- (B) 5
- (C) 7
- (D) 10

2. A bicycle has a front wheel radius of 15 inches. If the bicycle wheel travels 10 revolutions, how far has a point on the outside of the wheel traveled, in inches?

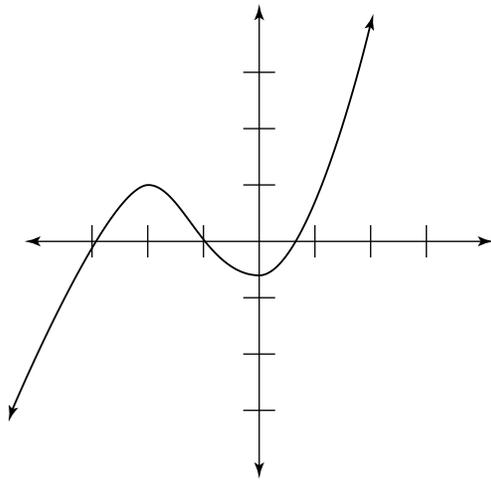
- (A) 10
- (B) 30
- (C) 300π
- (D) 450π

3. If p and q are positive integers, then

$(5^{-p})(5^{q+1})^p$ is equivalent to

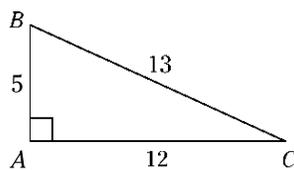
- (A) 5^{pq+p}
- (B) 5^{pq}
- (C) 5^{pq-p}
- (D) 5^{q+1}

4. In a set of five positive whole numbers, the mode is 90 and the average (arithmetic mean) is 80. Which of the following statements is false?
- (A) The number 90 appears two, three, or four times in the set.
 (B) The number 240 cannot appear in the set.
 (C) The number 80 must appear exactly once in the set.
 (D) The five numbers must have a sum of 400.
5. In a triangle, the second side is 3 centimeters longer than the first side. The length of the third side is 5 centimeters less than twice the length of the first side. If the perimeter is 34 centimeters, find the length, in centimeters, of the longest side.
- (A) 3
 (B) 9
 (C) 12
 (D) 13
6. Melvin, Chris, Enoch, Dave, Carey, Mike, Dan, and Peter are choosing dorm rooms for college. Each room holds four people. They have the following requirements:
- I. Mike and Melvin refuse to live together.
 - II. Enoch will live with Chris or Carey (or possibly both).
 - III. If Dave and Dan live together, Peter will live with them.
- When rooms are chosen, Melvin, Carey, and Dan live together. Which of the following groups must live in the other room?
- (A) Chris, Dave, and Mike
 (B) Chris, Mike, and Peter
 (C) Dave, Enoch, and Peter
 (D) Dave, Mike, and Peter
7. If the distance from Springfield to Watertown is 13 miles and the distance from Watertown to Pleasantville is 24 miles, then the distance from Pleasantville to Springfield in miles could not be
- (A) 10
 (B) 11
 (C) 13
 (D) 24
8. In a certain game, there are only two ways to score points; one way is worth 3 points, and the other is worth 5 points. If Brandon's total score is 61, which of the following could be the number of 3-point scores that Brandon had?
- (A) 10
 (B) 11
 (C) 12
 (D) 13
9. Which of the following complex numbers is equal to $(2-3i)-(4i^2+5i)$ for $i^2=-1$?
- (A) $6+2i$
 (B) $6-2i$
 (C) $6-8i$
 (D) $6-12i$
10. If the square of x is 12 less than the product of x and 5, which of the following expressions could be used to solve for x ?
- (A) $x^2 = 5x - 12$
 (B) $x^2 = 12 - 5x$
 (C) $2x = 12 - 5x$
 (D) $2x = 5x - 12$
11. If $2y - c = 3c$, then $y =$
- (A) $\frac{c}{2}$
 (B) c
 (C) $\frac{3c}{2}$
 (D) $2c$
12. The solution set to the equation $|3x - 1| = 7$ is
- (A) $\{2\}$
 (B) $\left\{2, \frac{2}{3}\right\}$
 (C) $\left\{-2, \frac{2}{3}\right\}$
 (D) $\left\{-2, \frac{8}{3}\right\}$



13. If this graph represents $f(x)$, then the number of solutions to the equation $f(x) = 1$ is
- (A) zero
 (B) one
 (C) two
 (D) three

14. A square with an area of 25 is changed into a rectangle with an area of 24 by increasing the width and reducing the length. If the length was reduced by 2, by how much was the width increased?
- (A) 2
 (B) 3
 (C) 4
 (D) 5

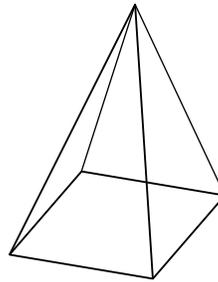


15. In triangle ABC above, if $\sin B = \frac{12}{13}$ and $\cos B = \frac{5}{13}$, what is $\tan C$?
- (A) $\frac{5}{13}$
 (B) $\frac{12}{13}$
 (C) $\frac{5}{12}$
 (D) $\frac{12}{5}$

16. Samira took four exams. Her scores on the first three were 89, 85, and 90. If her average (arithmetic mean) of all four exams was 90, what did she get on the fourth exam?

17. If $p > 0$ and the distance between the points $(4, -1)$ and $(-2, p)$ is 10, find p .

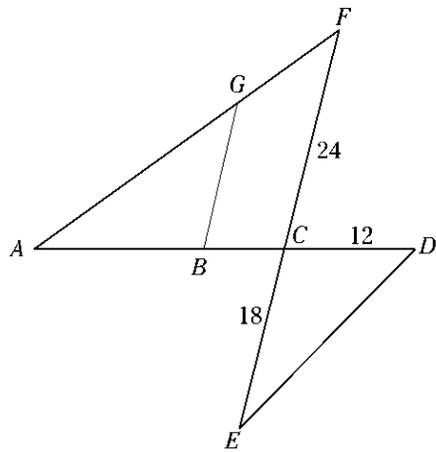
18. If $a - b = 8$ and $ab = 10$, find $a^2 + b^2$.



19. The preceding pyramid has a square base of length 10 centimeters and a height of 12 centimeters. Determine the total surface area of all five faces, in square centimeters.

20. If $a > 0$, which of the following statements must be true?

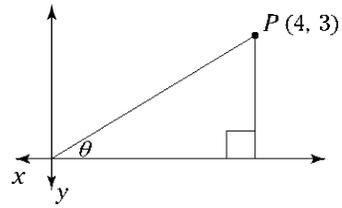
- (A) $a^2 > a$
 (B) $a > \frac{1}{a}$
 (C) $2a > a$
 (D) $\frac{1}{a} < 1$



21. In this diagram, $AF \parallel ED$, $GB \parallel EF$, and $AG = GF$.
What is the length of AB ?

(Note: Figure not drawn to scale.)

- (A) 18
- (B) 16
- (C) 12
- (D) 8



22. In the preceding drawing, what is $5(\sin \theta)$?

Check Your Work.

Continue to the next module when you're ready to move on.

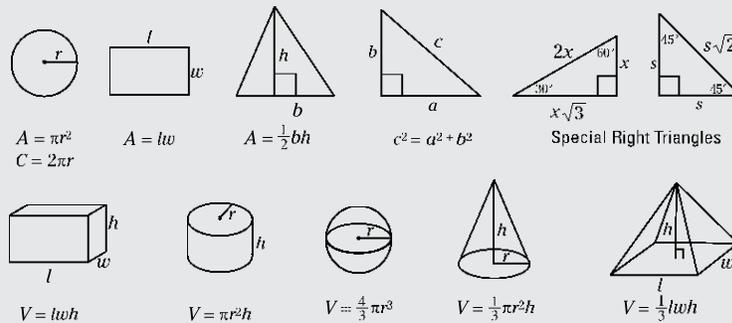
Module 2

TIME: 35 minutes for 22 questions.

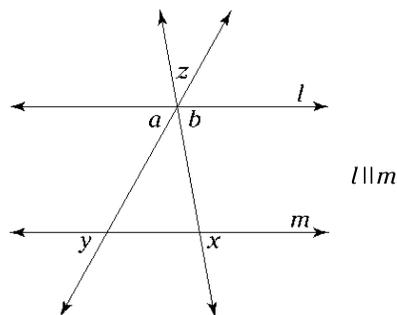
DIRECTIONS: For multiple-choice questions, choose only one answer for each question. For fill-in questions, write only one answer, even if you find more than one correct answer. Don't include symbols such as a percent sign, comma, or dollar sign.

NOTES:

- All numbers used in this exam are real numbers.
- All figures lie in a plane.
- All figures may be assumed to be to scale unless the problem specifically indicates otherwise.
- The domain of a given function f is the set of all real numbers x for which $f(x)$ is a real number, unless the problem specifically indicates otherwise.
- You may use a calculator.



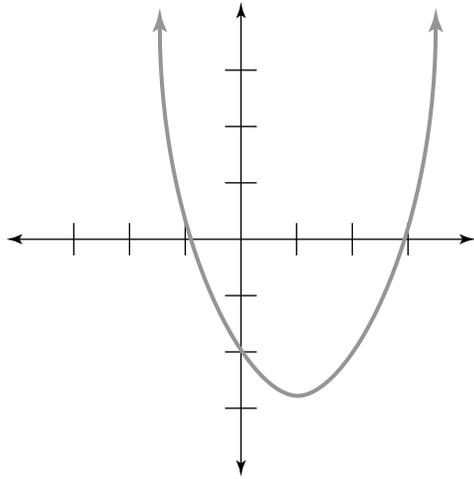
- The number of degrees in a circle is 360.
- The number of radians in a circle is 2π .
- The sum of the measures of the angles of a triangle is 180.



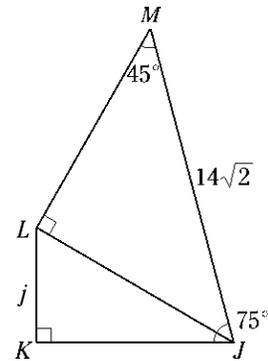
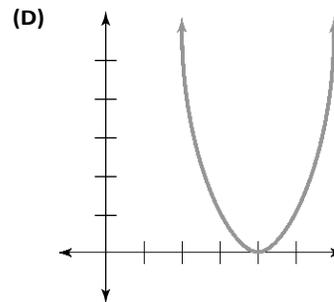
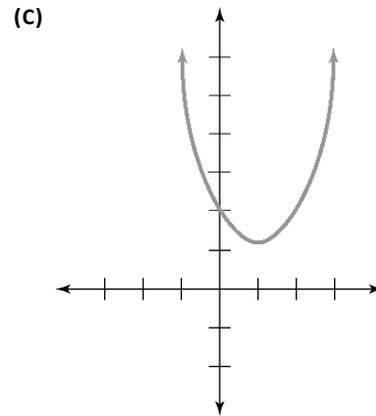
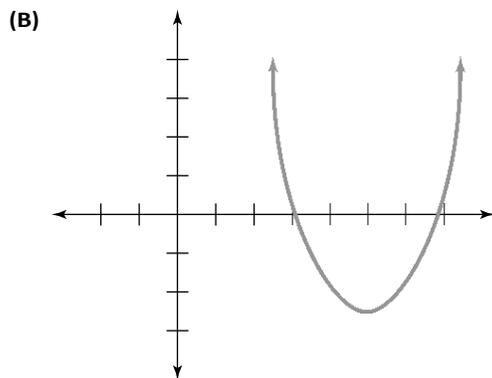
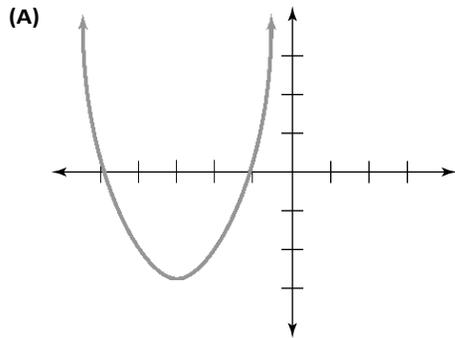
1. In the preceding diagram, $x = 70^\circ$ and $y = 30^\circ$. The sum $a + b + z$ equals
- (A) 90°
 (B) 100°
 (C) 120°
 (D) 180°

$$y = 20x + 25$$

2. The preceding equation models the total cost y , in dollars, that a sports shop charges a customer to rent a pair of skis for x days. The total cost consists of a flat fee plus a charge per day. When the equation is graphed in the xy -plane, what does the y -intercept of the graph represent in terms of the model?
- (A) Total daily charges of \$45
 (B) A flat fee of \$25
 (C) A charge per day of \$20
 (D) A charge per day of \$25



3. The above graph represents a function, $f(x)$. Which of the following graphs could represent $f(x+4)$?



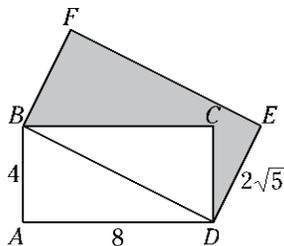
4. In the diagram above, the measure of side j is
- (A) 7
 - (B) $7\sqrt{2}$
 - (C) $7\sqrt{3}$
 - (D) 14

5. A cylindrical glass containing ice cubes is filled to the very top with iced tea. The base of the glass is 20 square centimeters and the height is 10 cm. If 78 cubic centimeters of iced tea is needed to fill the glass to the top, which of the following is closest to the total volume of ice cubes in the glass?

(A) 22
 (B) 78
 (C) 122
 (D) 145

6. Max has three hours to study for his tests the next day. He decides to spend k percent of this time studying for math. Which of the following represents the number of minutes he will spend studying for math?

(A) $\frac{k}{300}$
 (B) $\frac{3k}{100}$
 (C) $\frac{100k}{180}$
 (D) $\frac{180k}{100}$



7. Given that $ABCD$ and $BDEF$ are rectangles, find the shaded area in this diagram.

(A) 24
 (B) $16\sqrt{5}$
 (C) 20
 (D) $8\sqrt{5}$

8. A 26-inch-diameter bicycle wheel rotates a half turn. What is the exact distance traveled, in inches, of the logo printed on the edge of the wheel?

(A) $26x$
 (B) $13x$
 (C) 6.5π
 (D) 3.25π

$$p(t) = \frac{20,000(2)^{\frac{t}{4}}}{t}$$

9. The preceding equation represents the population of a yeast culture, p , for t weeks after the population was seeded. What is the population after 8 weeks?

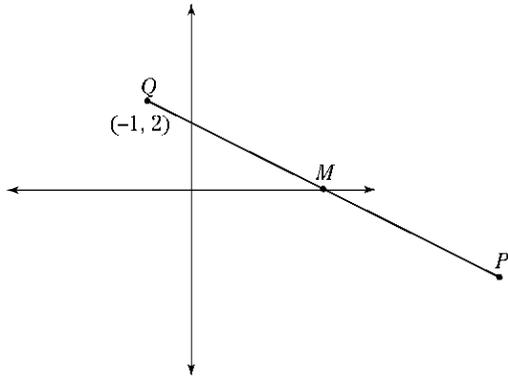
(A) 10,000
 (B) 20,000
 (C) 40,000
 (D) 160,000

10. A certain radioactive element has a half-life of 20 years. Thus, a sample of 100 grams deposited in 1980 would have decayed to 50 grams by 2000 and to 25 grams by 2020. How much of this sample would remain in 2100?

(A) $\frac{25}{16}$ grams
 (B) $\frac{25}{8}$ grams
 (C) $\frac{25}{4}$ grams
 (D) $\frac{25}{2}$ grams

11. A circle in the xy -plane has the equation $(x - 4)^2 + (y - 1)^2 = 9$. Which of the following points lies in the interior of the circle?

(A) $(-4, 1)$
 (B) $(-1, 1)$
 (C) $(0, 0)$
 (D) $(4, -1)$



12. In this figure, the slope of line \overline{PQ} is $-\frac{1}{3}$, and M is the midpoint of the line \overline{PQ} . What are the coordinates of Point P ?

- (A) $(8, -1)$
- (B) $(9, -1)$
- (C) $(10, -2)$
- (D) $(11, -2)$

13. If $ab = n$, $b + c = x$, and $n \neq 0$, which of the following must equal n ?

- (A) $ax + c$
- (B) $ax - c$
- (C) $a(x - c)$
- (D) $x(a - c)$

14. The number g is divisible by 3 but not by 9. Which of the following could be the remainder when $7g$ is divided by 9?

- (A) 0
- (B) 2
- (C) 4
- (D) 6

15. Darren receives \$15 an hour for his afterschool job but gets paid $1\frac{1}{2}$ times this rate for each hour he works on a weekend. If he worked 18 hours one week and received \$315, how many of these hours did he work during the weekend?

16. In a school survey, 40% of all students chose history as their favorite subject; 25% chose English; and 14 students chose some other subject as their favorite. How many students were surveyed?

17. If $\sqrt{|x+3|} = 3$ and $x \geq 0$, what is the value of x ?

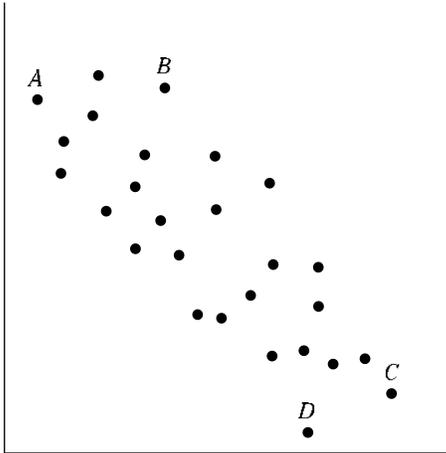
18. $y = x^2 - 2x + 6$
 $y = 2x + 3$

If the ordered pair (x, y) satisfies the preceding system of equations, what is one possible value of x ?

19. To rent a private party room in a restaurant, there is a fixed cost plus an additional fee per person. If the cost of a party of 8 is \$270 and the cost of a party of 10 is \$320, find the cost, in dollars, of a party of 18.

20. The volume of a gas, V , in cubic centimeters (cc), is directly proportional to its temperature, T , in Kelvins (K). If a gas has a volume of 31.5 cc at 210 K, then its volume at 300 K would be

- (A) 121.5 cc
- (B) 49 cc
- (C) 45 cc
- (D) 22.05 cc



21. If the data in the preceding scatter plot were approximated by a linear function, the line would come closest to which pair of points?

- (A) *A* and *B*
- (B) *A* and *C*
- (C) *B* and *C*
- (D) *C* and *D*

22. Siva invested \$1,200 into two accounts. One account yields 5 percent simple annual interest, and the other yields 7 percent simple annual interest. If after exactly one year, the two investments yielded a total of \$74 in interest, how much, in dollars, was invested into the account earning 5 percent interest? Ignore the dollar sign when placing your answer.

Check your work.

Continue to Chapter 14 when you're ready to grade your exam.

Practice Test 2: Answers and Explanations

Section 1: Reading and Writing

Module 1

- 1. D.** Choice D, *likely to*, is the most logical phrase to fit in the blank in the sentence. Choices A and B are illogical because these species are threatened, which indicates that their becoming endangered isn't *definite* or *inevitable*. Choice C is incorrect because *probably able to* suggests the species have some say in the matter, which they don't.
- 2. B.** The best word to fill in the blank is *different* because the sentence states that choosing people who are similar won't yield accurate or beneficial results. Choices A and C are both words that mean the opposite of what the text states. Choice D isn't logical because *conflicting* ages doesn't make sense.
- 3. A.** Choice A, *hampered*, means hindered or impeded by, so it logically fits into the blank. It makes sense that the absence of a system of addressing would impede efforts to supply services. None of the other choices have the negative connotation of *hampered*.
- 4. B.** Choice B, *supposed* is the best word to fill in the blank because the astronomers don't know for sure that the Sun and its planets were once in such a spiral. *Supposed* means generally assumed or believed to be the case. None of the other choices make sense in the sentence.

5. **D.** All the evidence in the sentence points to Choice D, *relentless*, which means nonstop or incessant. It is the best word to describe a river that is rapidly rising and a flood plunging by carrying trees and logs. Choices B and C are the opposite of *relentless* and Choice A, *deceitful*, is illogical.
6. **A.** The context clues in the sentence (the leaves are gone, larvae consume the bark) lead to Choice A, *defoliate*, which means to remove the leaves from a plant. The other choices, embark (to begin), empower (to give power), and engender (to give rise to), do not make sense in the context of the passage.
7. **A.** Choice A, *recount*, means to tell or give an account of something. It is the logical choice to fill in the blank in a sentence about Homer using flashbacks in his storytelling. The other choices, reuse (to use again), reinstate (to put back into a position), and rescind (to take back what was previously given) are not logical in this sentence.
8. **C.** The underlined sentence offers an alternative explanation (*eruptions are preceded by different build-up periods*) to a speculative relationship (*possibly suggesting a cause-and-effect relationship*) referred to earlier in the text. The underlined sentence doesn't state a hypothesis that is contradicted by evidence (Choice A) or present a generalization that is exemplified by the discussion of the volcanoes (Choice B). It also doesn't clarify **WHY** volcanoes are preceded by different build-up periods (Choice D).
9. **A.** Of the four questions in the choices, only Choice A, *Why do scientists study the genes of organisms other than human beings?* can be answered by the information in the text. The questions in Choices B, C, and D cannot be answered by the information in the text.
10. **D.** Choice D is the best explanation of the difference between a linear and a web-like representation of the food chain. As the text implies, the linear relationship is a straight line; for example, the sun provides energy to the dandelion; the dandelion provides food for the rabbit; the rabbit is food for the hawk. In a web-like system, energy flows in multiple directions, not simply in a straight line. Choice A is inaccurate; a linear representation is less complex than a web-like representation. Choice B is incorrect because the representations have nothing to do with inorganic versus organic relationships. Choice C is incorrect; the difference has nothing to do with human versus non-human.
11. **A.** No trick here: just a careful reading of the chart and the legend. Notice on the legend that the dark-gray dot represents *females* and the light-gray dot represents *males*. Find each occupation on the chart and locate the earnings data. The placement of the dots will reveal that postsecondary female teachers have a higher median income than that of male chefs and head cooks. None of the other choices are supported by the data on the chart.
12. **B.** Once again, use your careful reading techniques to follow the data. You will note that as the estimated world population increases from 1 to 9 billion, the number of years estimated to add 1 billion people decreases and then increases slightly at the end of the column. None of the other choices accurately interpret the data.
13. **D.** According to the text, *all acts of production and consumption are fundamentally acts of "prosumption."* This means that while the two processes are on opposite sides of the spectrum, they are on the same spectrum. None of the other choices are accurate based on the textual information.

14. **C.** In the first stanza of the poem, the speaker describes a literal spider that he watches as it spins a web. In the second stanza, the speaker uses this web-creating image to philosophize about his soul as it too tries to form connections. Choice C best describes the structure of the two stanzas. Choice A reverses the structure of the poem. Choices B and D are not accurate readings of the poem.
15. **A.** The underlined sentence anticipates and responds to a critical response to his claim that Longfellow *stands easily in front of all other poets who have enriched American literature*. The writer concedes that Longfellow is not rugged, elemental, profoundly thoughtful, transcendental, and sympathetic, but he answers this argument with the bold claim that Longfellow *was our first artist in poetry*. Choice B is incorrect because the writer doesn't dismiss Longfellow from the ranks of great American poets. Choice C is incorrect because the sentence doesn't provide specific examples to illustrate Longfellow's superiority. (It does the opposite!) Choice D is incorrect because the sentence doesn't illustrate a transcendent quality of Longfellow's poetry — in fact, it says he isn't transcendent.
16. **C.** The text presents information about the effects of campfires on the soil. In the underlined sentence, the writer calls attention to the harmful effects of a common camping activity — making a campfire. The underlined sentence doesn't elaborate on an example of organic matter as a measure of fertility (Choice A), or explain a methodology (Choice B), or offer a solution (Choice D).
17. **C.** To answer this question correctly, you must synthesize information from the text and the graphic. The graphic provides information about the seasonal life cycle of the beaver. To complete the sentence in the text, find the end of the summer on the graphic to determine what the beavers are doing. In August, as the beavers begin preparing for adulthood, they work on dam and lodge repair. The text indicates that as beavers build dams, some adjacent sites are flooded. By combining these two pieces of information, you will find that Choice C correctly uses the information from the graphic and the text as evidence that the properties near the beaver colonies will experience flooding. None of the other choices can be supported with text-based or graphic-based evidence.
18. **A.** Both Passage 1 and Passage 2 emphasize the importance of biodiversity. Passage 1 points out that the loss of biodiversity has harmful effects on living things and the environment. Passage 2 points out that biodiversity increases survival for living things. Thus, both passages agree that a loss of biodiversity or *reliance on a small number of food sources is a problem now and may become more severe in the future*. Choice B is incorrect because Passage 1 doesn't mention extinction. Choice C is incorrect because Passage 2 emphasizes that biodiversity increases food supply. Choice D is incorrect because Passage 1 explains that the interdependence of prey and predator is essential to biodiversity.
19. **B.** Choice B completes the text and conforms to the conventions of Standard English. The plural pronoun *them* (in the objective case because it is the object of the preposition *of*) is needed to refer to the plural noun *flocks*. Choice A is incorrect because it uses the wrong pronoun (*those*) and is unnecessarily wordy. Choice C is incorrect because it also uses the wrong pronoun (the subject pronoun *they*) and illogically adds a new verb phrase (*were flying*). Choice D is incorrect because it uses the pronoun *whom* to refer to flocks of birds and adds an unnecessary and wordy new verb phrase (*were able to fly*).

- 20. B.** Choice B conforms to the conventions of Standard English because it uses the singular form of the verb *is used* to agree with the singular subject *figure*. Don't fall into the trap of thinking that *estimates* is the subject of the verb; *estimates* is the object of the preposition in the prepositional phrase *of U.S. population estimates*; thus, it can't be the subject. Choices A and C incorrectly use the plural form of the verb *to be*. Choice D is incorrect because it lacks the helping verb *is*.
- 21. D.** This sentence provides a somewhat complicated punctuation issue, but if you analyze the clauses — and recognize the two independent clauses — you'll be fine. The first independent clause ends with the word *advancement*. This main clause is followed by additional information (also an independent clause) that explains or clarifies the main clause. The best mark of punctuation to use at the end of a main clause and before clarifying information is the colon. Choice A incorrectly uses a comma (remember to avoid the dreaded comma splice error!). Choice B uses the semicolon, which can be used to connect two independent clauses, but it adds the words *in the*, which don't make sense with the second clause that already has the verb phrase *is known*. Choice C is incorrect because it also adds the extra verb phrase without punctuation. Choice D correctly uses the colon after an independent clause and before clarifying information. (*Note:* An independent clause that follows a colon usually starts with a capital letter, but this is not a hard and fast rule.)
- 22. A.** Choice A, *however*, is the most logical transitional word to express the contrast between polar bears that remain on the receding pack ice and those that come on land to rest. None of the other choices provide a word to express a contrast.
- 23. D.** Choice D is the only choice to avoid a modification error by correctly beginning with the word *Charlie*. The modifying phrase that begins the sentence *While taking a few seconds to clean his glasses*, must be followed by the word being modified, *Charlie*. Logically, neither Charlie's car nor his heart is taking the time to clean his glasses (as is suggested by Choices A, B, and C).
- 24. C.** The singular form of the verb *was* is needed to agree with the singular subject *match*. Again, don't be tricked by those pesky prepositional phrases (*in the semifinals*) that comes between the subject (*match*) and the verb (*was*). Be sure to also be consistent in tenses: Choices B and D incorrectly use the present tense to refer to action that took place in the past.
- 25. A.** Choice A correctly uses the adverb *deeply* to modify the adjective *incised*. Choice B incorrectly uses the adjective *deep*: You need an adverb to describe how much (or to what extent) the plateau is *incised* (or carved). Choice C is incorrect because *deeper* is the comparative form of the adjective *deep*. Choice D is incorrect because *deepest* is the superlative form of the adjective *deep*.
- 26. B.** The best choice to emphasize the aim of the study is Choice B: *Understanding the structure and function of DNA and unlocking an individual's genetic code has helped scientists revolutionize the investigation of disease pathways*. Choice A is a detail about the human genome rather than a statement of the aim of the research study. Choice C is also a detail about DNA, not about the aim of the study. Choice D is close, but Choice B explains why scientists are doing this research, so it is the better choice.
- 27. D.** This question is another illustration of the importance of reading the prompt carefully. The prompt asks you to select the choice that best compares the lengths of the two longest rivers, so information that is **NOT** about the two longest rivers and their lengths is not relevant. Only Choice D most effectively compares the lengths of the two longest rivers.

Module 2

- 1. A.** Choice A, *featured*, is the best word to fit in the blank. In the context of the sentence, *featured* means included as an important part, and Dali included optical illusions as an important part of his paintings. Choice B is incorrect because *overwhelmed* is not logical in the context of the sentence. Choice C is also incorrect because nothing in the sentence suggests Dali *discredited* optical illusions. Choice D, *renewed*, also does not fit in the logic of the sentence.
- 2. D.** Choice D is the best answer because it logically completes the sentence. The two flowering plants are useful *indicators* of the timing of spring. Choices A, B, and C are illogical; the plants aren't useful *effects* or *varieties* or *species* of the timing.
- 3. A.** Choice A, *mystified*, is the best word to fit in the blank. The unidentified creature *mystified* (puzzled) naturalists *who did not know how to classify* it. Choice B might have tempted you because it's possible the naturalists were *delighted* with the creature, but the context clues in the sentence (*seemingly catch-all characteristics, did not know, we now know*) suggest they were confused or *mystified*. They certainly weren't *settled* or *confident*, so Choices C and D are illogical.
- 4. B.** Choice B, *locate*, is the best word to fill in the blank. The researchers are using computer tools to find or *locate* signals that control how genes work. There is no contextual evidence to suggest the researchers want to *disrupt*, *question*, or *influence* the signals, so Choices A, C, and D are incorrect.
- 5. C.** Always use the logic of the sentence and the context clues to help you select the best word to fill in the blank. In this sentence, the logic suggests that a conservation law has been enacted to *safeguard* or protect ancient ruins. It certainly wouldn't attempt to *raze* (tear down) or *reconfigure* (rearrange) the ruins, so Choices A and B are incorrect. It also doesn't make sense to enact a conservation law to *complete* ancient ruins; then they wouldn't be ancient ruins! And, there is no context clue to suggest this action.
- 6. C.** Choice C completes the text with the most logical and precise word because it conveys the elevation of the *pedestrian* (dull, ordinary) plot by the *exquisite* (gorgeous) cinematography of the film. Choices A, *ordinary*, and D, *banal* (dull or trite), are too close in meaning to *pedestrian* and so would not elevate the plot. Choice B, *abundant*, doesn't make sense: The whole film consists of cinematography.
- 7. D.** Choice D best expresses the primary claim of the speaker. The speaker clearly states that *we don't take enough advice . . .* and we should model *our lives on the disinterested opinion of other people*. Based on the context, the speaker would disagree with Choices A, B, and C, none of which are stated in or implied by the text.
- 8. C.** Choice C best states the function of the underlined sentence in the overall structure of the text. The text describes the singing style of Mary Garden but points out that her *conception and acting* were qualities that most *intrigued* the writer. The sentence doesn't criticize the performance (Choice A) or provide an objective analysis (Choice B) or praise the coloratura style of the singer (Choice D).
- 9. A.** Choice A most logically completes the text. It follows that *the more independent, knowledgeable, and skilled classes* would have received a better education and have *talents and acquirements*. Choice B is clearly contradicted by the text: *neither lords nor common people*. Choice C is also contradicted by the text: *neither rich nor poor*. Choice D sounds like it could be true, but no evidence in the text indicates they had a *natural affinity for mental jobs* or *physical prowess*.

- 10. B.** Choice B is the best choice because the quotations in the text establish an authoritative tone; they use the words of well-known Greek philosophers to support the content. Choice A is incorrect because the quotations do not conflict with the evidence. Choice C is incorrect because the text doesn't imply that more research is wanted or needed. Choice D is incorrect because the quotations are too short to give a sense of Greek literary style, and they are included to suggest that the evidence of the historical context adds authority to the informative text.
- 11. A.** Choice A is the quotation that most logically and effectively completes the text. The focus of the content is Poe's *musical flow of language*. The text mentions *poetic harmony*, *melodious fancy*, and *distant music at night*, all descriptions of the musical quality of Poe's writing. Thus, Choice A logically follows the text. While the other choices do describe Poe's writing, only Choice A directly references the musical quality of his writing.
- 12. C.** Choice C completes the text with the most logical example; the correct answer must be an example of a variable that allows the assignment of probability. Choice A is incorrect because the characteristics of the sample that remain constant are not variables. Choice B is incorrect for the same reason: The total number of a population is not a variable that allows the assignment of probability. Choice D can be eliminated for the same reason: There is no assignment of probability.
- 13. B.** Choice B would explain the discrepancy in the results of Mr. Burns' experiment: if one area of the yard has better soil or more sun, for example, these factors could affect the growth of the plant. Choices A, C, and D are incorrect because none of these choices offer any variable to account for the discrepancy.
- 14. A.** Choice A best describes the function of the underlined portion of text. To clarify how the waxes in the cuticle prevent water loss, the writer uses an analogy, comparing the wax in the leaf to the wax on your car that prevents water from reaching the paint. Choice B is incorrect because the underlined portion doesn't refute an assertion in the first part of the sentence. Choice C is incorrect because the underlined portion doesn't provide an example that is expanded on in the next sentence. Choice D is incorrect because the underlined portion doesn't indicate another function of the cuticle layer; it simply offers an analogy.
- 15. C.** By pointing out a limitation of instrumental observations, the underlined sentence describes *a shortcoming of a method of scientific investigation* (that is, using instruments for observation). The underlined sentence doesn't summarize the results of a study (Choice A) or offer *an example of how observations can assist by providing eyewitness evidence* (Choice B) or present *a central finding in the science of dendroclimatology* (Choice D).
- 16. B.** The main idea of the text is that the writer has gained technical knowledge of the river (*mastered the language of this water*) as a pilot but has lost an appreciation of its beauty (*lost something which could never be restored to me while I lived. All the grace, the beauty, the poetry had gone out of the majestic river!*). Choice A is incorrect because a pilot must watch the river carefully and analytically and cannot spend his days simply appreciating nature. Choice C may indeed be true, but it is not the main idea of the text. There is no evidence to support Choice D as the main idea of the text.
- 17. C.** Based on the data in the chart, at the end of Interval D– E, the automobile is both stationary and farthest from the starting point (of course, because it is at the end of the drive). No data in the chart supports Choices A or D because speed is not included in the chart. Choice B is incorrect because it is inaccurate; the automobile travels the greatest distance during interval A– B.

- 18. D.** Choice D is supported by the information in the chart: The numbers of Winter Bentgrass and Purple Lovegrass decline while those of Little Bluestem, Path Rush, and Canada Goldenrod increase. Thus, you may conclude that plant populations are replacing each other. Choice A is incorrect because both these species thrive, so you can't conclude that they compete. No evidence in the text or chart supports either Choice B or Choice C.
- 19. B.** Choice B is correct; *travelers'* is the correct punctuation for a plural possessive noun, and no apostrophe is needed with *stories* — it is simply plural. Choice A incorrectly adds an apostrophe to a plural noun that is not possessive (*stories'*). Choice C omits the necessary apostrophe with *travelers*. Choice D incorrectly adds an apostrophe to make *story's* a singular possessive rather than plural (*stories*).
- 20. B.** Choice B conforms to the conventions of Standard English and is correct because no commas are used with essential information; the name of the attorney is essential to the sentence. Choice A is incorrect because no commas are needed around *Matthew Brady* or after *because*. Choice C and D both have unnecessary commas.
- 21. D.** Choice D conforms to the conventions of Standard English because the participial phrase *Gifted with a good voice and well educated musically* modifies *he*, so *he* must immediately follow the modifying phrase. When modification is the grammatical issue in the text, remember to put the word being modified as close as possible to the modifying phrase. Choice A incorrectly begins with *it* rather than *he*. Choice B incorrectly begins with *the city* rather than *he*. Choice C incorrectly begins with *Louvain* rather than *he*. Logically, only *he* is gifted, so only *he* can follow the modifying phrase.
- 22. A.** The punctuation is a bit tricky in this text. It is important to determine whether *though* belongs to the first clause (*Black teachers were not allowed to teach in the Charleston public schools*) or the second clause (*most found themselves teaching in rural, underfunded schools*). Logically, *though* belongs with the first clause because that clause contrasts with the previous sentence that ends with *her career as a teacher*. The comma before *though* is correct: when *though* is used at the end of a sentence, it is an adverb meaning *however*. It is separated from the first part of the sentence by a comma. The semicolon after *though* is correct because it joins two main clauses. Choice B makes the dreaded comma splice error. Choice C incorrectly uses a semicolon before *though*. Choice D is incorrect because it doesn't punctuate the two main clauses correctly and uses an unnecessary comma after *most*.
- 23. B.** Only Choice B completes the text so that it conforms to the conventions of Standard English: *The bright coloring of a monarch serves as a warning to predators . . .* Choice A may tempt you, but notice the word *to* after the blank. You wouldn't write *serves to warn to predators*. Choice C uses the non-idiomatic *serves by warning to*. Choice D is awkward, wordy, and ungrammatical.
- 24. C.** The conventions of Standard English require parallelism in items in a series. In Choice C, all the items in the series are parallel verb phrases: *cause no pollution*, *make little or no noise*, *use no gas*. Choices A, B, and D are all unparallel.
- 25. C.** Choice C, *therefore*, is the logical transition in this sentence because the second half of the sentence is a result of the first half. *Therefore* means as a result: Because the birds had no natural enemies, they became wingless. None of the other choices indicate the *as a result* relationship.

26. **B.** Choice B is the best choice to explain why the Everglades National Park is such a captivating attraction to tourists, conservationists, plant enthusiasts, animal lovers, and so many others. Choice B specifically explains that the appeal of the Everglades lies in its unique ecosystem, its plant life, and its fauna (animals). Choices A, C, and D are true statements, but they offer details from the notes that do not directly answer the prompt.
27. **A.** Choice A answers the prompt most effectively because it specifically compares the prevalence of asthma in children based on race. Choice B compares one aspect of the prevalence of asthma by race, but it does not respond as clearly and specifically to the prompt as Choice A. Choice C is incorrect because it doesn't mention race. Choice D also doesn't mention race.

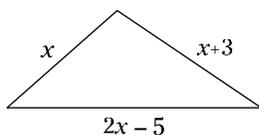
Section 2: Math

Module 1

1. **B.** Add the two expressions:

$$\begin{array}{r} 2a + 3b = 17 \\ + (2a + b = 3) \\ \hline 4a + 4b = 20 \\ a + b = 5 \end{array}$$

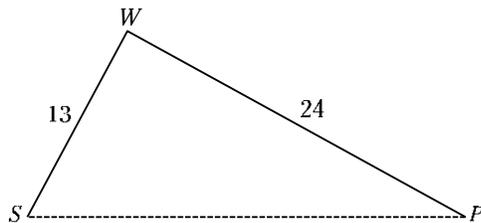
2. **C.** An SAT classic. (The SAT should have its own YouTube channel. Oh wait, it does.) If the wheel has a radius of 15 inches, it has a circumference of 30π (because circumference is $2\pi r$). Ten revolutions carry a point on the outside of the wheel 10 times the circumference, for $10 \times 30\pi = 300\pi$.
3. **B.** Start with $(5^{q+1})^p$. When you take a power of a power, such as $(5^{q+1})^p$, you multiply the powers: $(5^{q+1})^p = 5^{p(q+1)}$. Next, multiply this by the other part of the question, (5^{-p}) . When you multiply the same numbers with exponents, you add the exponents, so leave the 5 and just add the exponents. In this case, the p and $-p$ cancel out, leaving the pq : $(5^{p(q+1)})(5^{-p}) = 5^{pq}$.
4. **C.** Look at the statements one at a time. Choice (A) is true. The mode appears most often, so there will be two, three, or four 90s. Choice (B) requires you to remember the formula $total = number \times mean$. In this case, the five numbers must add up to $5 \times 80 = 400$. Because you know there are at least two 90s, which add up to 180, the other three numbers must add up to 220. But because the numbers are all positive, and 240 is greater than 220, there is no room in the set for 240 and 2 additional values. However, for Choice (C), you can make a list that averages 80 but doesn't have 80 in it. The list *could* have 80 but doesn't *have to* have 80. Choice (D) is definitely true; you used this fact already when you checked Choice (A).
5. **D.** Draw the triangle with x as the first side, $x + 3$ as the second side, and $2x - 5$ as the third side. The finished triangle looks like this:



The perimeter, 34, is the sum of all the sides. Solve for x ; then place that value for x to get the side lengths:

$$\begin{aligned}(x) + (x + 3) + (2x - 5) &= 34 \\ 4x - 2 &= 34 \\ 4x &= 36 \\ x &= 9 \\ (9) + (9 + 3) + (2 \cdot 9 - 5) &= 34 \\ 9 + 12 + 13 &= 34\end{aligned}$$

- 6. A.** Call the room shared by Melvin, Carey, and Dan room X, and the other room Y. Because Mike and Melvin won't live together, Mike must be in room Y. Now, if Dave and Dan live together, Peter will live with them, but you can't fit two more people into room X, so Dave and Dan must live apart, which puts Dave in room Y also. Similarly, you know that Enoch will live with Chris or Carey, so Chris can't be in room X, either. That puts Chris, Dave, and Mike in room Y.
- 7. A.** Make a quick drawing of the situation. (Remember, the towns don't have to be in a straight line.)



The distance you're interested in is the dotted line. Use the triangle inequality, which tells you that the sum of any two sides of a triangle must be greater than the third side. The number 10 doesn't satisfy the inequality, because $10 + 13 = 23$, which is less than 24.

- 8. C.** If you multiply each of the choices by 3 points, you get 30, 33, 36, and 39. Because all the other scores are worth 5 points, you must be able to add a multiple of 5 to one of these numbers to get 61. The only one that works is 36, because $36 + 25 = 61$.
- 9. C.** Distribute the negative and simplify the expression:

$$\begin{aligned}(2 - 3i) - (4i^2 + 5i) \\ 2 - 3i - 4i^2 - 5i \\ 2 - 8i - 4(-1) \\ 2 - 8i + 4 \\ 6 - 8i\end{aligned}$$

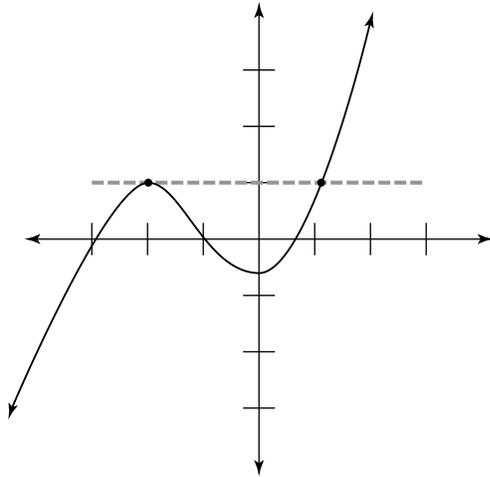
- 10. A.** Twelve less than something is the thing minus 12, not the other way around. So you want an expression that says "X squared equals 5 times X minus 12," and that's Choice (A).
- 11. D.** To solve for y , isolate y on one side of the equation:

$$\begin{aligned}2y - c &= 3c \\ 2y &= 4c \\ y &= 2c\end{aligned}$$

12. D. Solve the equation using the positive and negative values of the expression:

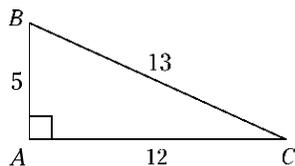
$$\begin{aligned} |3x - 1| &= 7 \\ 3x - 1 &= 7, -7 \\ 3x &= 8, -6 \\ x &= \frac{8}{3}, -2 \end{aligned}$$

13. C. The number of solutions to the equation $f(x) = 1$ is just the number of times that the graph has a height of 1, as shown here.



14. B. The length and width of the square are both 5 (because $5 \times 5 = 25$), so the new length, being narrower by 2, is 3. And 3 times the new width is 24 (the area of the rectangle), so the new width is 8 (because $24 \div 3 = 8$). The width went from 5 to 8, for an increase of 3.

15. C. Using ol' SOH-CAH-TOA, because $\sin B = \frac{\text{opposite}}{\text{hypotenuse}} = \frac{12}{13}$ and $\cos B = \frac{\text{adjacent}}{\text{hypotenuse}} = \frac{5}{13}$, you can label the sides of the triangle like this:



The tangent is of a different angle, but the principle is the same:

$$\tan C = \frac{\text{opposite}}{\text{adjacent}} = \frac{5}{12}$$

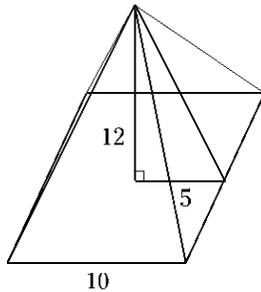
- 16. 96.** This problem is easy if you remember an easy trick: $total = number \times average$. In this case, the total must equal $4 \times 90 = 360$. Adding up Samira's first three scores gives you 264, and $360 - 264 = 96$.
- 17. 7.** Remember the distance formula? It tells you that the distance between two points, (x_1, y_1) and (x_2, y_2) is $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$. Substituting your numbers, you get

$$\begin{aligned} 10 &= \sqrt{([-2] - [4])^2 + (p - [-1])^2} \\ &= \sqrt{(-6)^2 + (p+1)^2} \\ &= \sqrt{36 + (p+1)^2} \end{aligned}$$

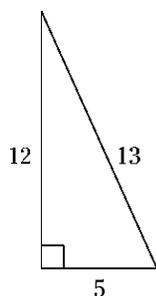
Square both sides, and $100 = 36 + (p+1)^2$. Now solve for p :

$$\begin{aligned} 64 &= (p+1)^2 \\ 8 &= p+1 \\ 7 &= p \end{aligned}$$

- 18. 84.** You could try to figure out what a and b equal, but you don't need to. The key to getting this question right is remembering the formulas discussed in Chapter 8 — specifically, the one that says that $(a-b)^2 = a^2 - 2ab + b^2$. You know that $a-b=8$, so $(a-b)^2 = a^2 - 2ab + b^2 = 64$. You're being asked for $a^2 + b^2$, which is $(a^2 - 2ab + b^2) + 2ab$, or $64 + 2(10) = 84$.
- 19. 360.** The total surface area is the sum of the area of the square and the area of the four triangles. The square is easy: It's $10 \times 10 = 100$. The triangles are tougher. They don't have a height of 12. Twelve is the height of the pyramid, but the triangles are slanted. However, you can find the height of the slanted triangles by using the Pythagorean Theorem, as shown in the following diagram:

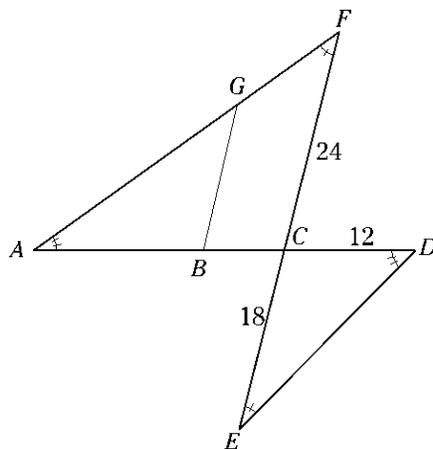


That little triangle in the diagram is a right triangle. One leg is 12, the height of the pyramid. The second leg is half the width of the square, or 5. This is a common right triangle, the 5-12-13 triangle. (If you didn't remember this one, you could have figured it out with the Pythagorean Theorem.)



The hypotenuse, 13, is the altitude of each of the tilted triangles that make up the sides of the pyramid. Because the triangle's area is $\frac{1}{2} \times \text{base} \times \text{height}$, each triangle's area is $\frac{1}{2} \times 10 \times 13 = 65$. The four triangles together have an area of $4 \times 65 = 260$. Adding in the 100 from the base gives you 360.

- 20. C.** If a equals 2 or more, then all the answer choices are true. However, if a equals 1, or a number less than 1, such as $\frac{1}{2}$, most of answer choices become false. This question is an old SAT trap: Numbers between 0 and 1 (such as fractions) behave in funny ways. The only statement that is true for all positive numbers, whether fraction or whole, is Choice (C): Twice any positive number must be bigger than the original number.
- 21. D.** Because there are parallel lines in this problem, you need to look for angles that are congruent. You can find them by looking for lines that make a Z or a backward Z. Looking first at the bigger triangles, you can mark the diagram as follows:



Notice that the two angles in the middle are vertical, so they're also equal. This is a picture of similar triangles: Angle F matches angle E , angle A matches angle D , and angle C is the same for both triangles. Therefore, you can use a ratio to figure out the length of AC :

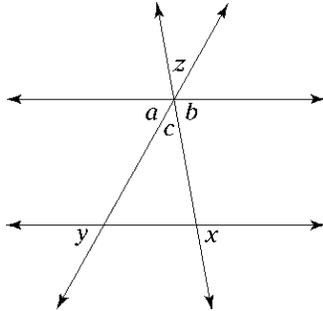
$$\frac{AC}{CD} = \frac{CF}{CE} \text{ and } \frac{AC}{12} = \frac{24}{18}, \text{ which reduces to } \frac{AC}{12} = \frac{4}{3}$$

Be careful that you match up the right parts when writing a ratio. Anyway, cross-multiplying your ratio tells you that $3(AC) = 48$, and $AC = 16$. Now, because $GB \parallel EF$, triangle ABG is similar to ACF as well. And, because $AG = GF$, the line GB cuts triangle ACF in half. That means that AB is half of AC , or 8.

- 22. 3.** Find the value of $\sin \theta$ and multiply it by 5. If the coordinates of point P are $(4,3)$, the diagonal is 5 (as in, 3-4-5 right triangle). Use the SOH from SOH-CAH-TOA to get that $\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}}$, which in this case is $\frac{3}{5}$. Multiply this by 5 for an answer of 3.

Module 2

1. **D.** You don't need to know what x and y equal in this problem. Look at the angle marked C in the following diagram. You know that C and Z are vertical angles, which means that their measures are equal. Also, a , C , and b form a straight line, so $a + C + b = 180^\circ$. Therefore, $a + b + z = 180^\circ$.



2. **B.** Walking out the door with skis, the customer is charged \$25. That is the y -intercept of the graphed line. Each day the customer holds the skis (whether they're used or not) is another \$20 charge, but that's represented by the slope of the line, not the y -intercept.
3. **A.** This question is based on the rules of graphed figures. From the graph, $f(x)$ is another name for the y -value based on x . A higher x -value moves the point farther to the right. In the graph, $f(x+4)$ reads the value inside the parentheses (usually x , but in this case $x+4$) as four spaces farther to the right than it actually is, so the graph moves four spaces to the left to compensate.
4. **A.** Do you remember your special triangle ratios? If not, it's okay: They're in the pop-up when you click Reference on the math portion of the SAT. First, spot the common right triangles by breaking up the 75° angle at the bottom right into 45° and 30° angles. The top right triangle is a 45-45-90 triangle, which makes both of its legs equal to 14. The bottom leg is also the hypotenuse of the 30-60-90 triangle at the bottom. In a 30-60-90 triangle, the hypotenuse must be twice the shortest leg, which is j . Therefore, j is 7.
5. **C.** If you forgot the equation for the volume of a cylinder, check the pop-up when you click the Reference button: the equation is right there for everyone else who also forgot. This formula, $V = \pi r^2 h$, basically states that volume is the base times the height — in this case, 20 square centimeters times 10 centimeters, for a volume of 200 cubic centimeters. Subtract the 78 cubic centimeters of iced tea, and the 122 cubic centimeters of ice cubes make up the remaining volume.
6. **D.** Because the answer is in minutes, start by turning 3 hours into 180 minutes. You know that k percent of these 180 minutes is going to be used for math. Remember that k percent means $\frac{k}{100}$. Taking a percent of a number involves multiplication, so your answer is $180 \times \frac{k}{100}$, or $\frac{180k}{100}$.

- 7. A.** You need the areas of rectangle $BDEF$ and triangle BCD . For the rectangle, you need the length of segment BD , which is also part of triangle ABD . Because you have two sides of right triangle ABD , use the Pythagorean Theorem to find the length of the third side, which is your target, BD : $4^2 + 8^2 = (BD)^2$, so $BD = \sqrt{80}$, or $4\sqrt{5}$. The area of the rectangle is $4\sqrt{5} \times 2\sqrt{5} = 8 \times 5 = 40$. The area of triangle BCD is $\frac{8 \times 4}{2} = 16$. Subtract the two, and $40 - 16 = 24$.
- 8. B.** The circumference of the wheel is πd , where d is the diameter of the wheel. Because $d = 26$ inches, the circumference is 26π inches. The logo traveled half this distance, so divide the circumference by 2, for an answer of 13π inches.
- 9. A.** Forget the online calculator — this one is easy. Just plug in 8 for t and the numbers work themselves out:

$$\begin{aligned} p(8) &= \frac{20,000(2)^{\frac{8}{4}}}{8} \\ &= \frac{20,000(2)^2}{8} \\ &= \frac{20,000(4)}{8} \\ &= \frac{80,000}{8} \\ &= 10,000 \end{aligned}$$

- 10. A.** Make a table for this one, dividing the sample by 2 for every 20 years:

Year	2000	2020	2040	2060	2080	2100
Sample	50	25	$\frac{25}{2}$	$\frac{25}{4}$	$\frac{25}{8}$	$\frac{25}{16}$

The final answer is $\frac{25}{16}$ grams.

- 11. D.** A circle with the equation $(x - 4)^2 + (y - 1)^2 = 9$ has a center of $(4, 1)$ and a radius of 3, so it certainly extends down 2 from the center and covers point $(4, -1)$. However, it is entirely to the right of the y -axis, placing Choices (A), (B), and (C) outside the circle.
- 12. D.** A slope of $-\frac{1}{3}$ means that the line goes down 1 unit for every 3 units it moves to the right. Because M is on the x -axis, the line has gone down 2 units by the time it reaches M , so it must have moved 6 units to the right. That means that M is at $(5, 0)$. M is the midpoint, which means that it's halfway to P . So, to get to P , move another 2 units down and 6 units right, which puts you at $(11, -2)$.
- 13. C.** Because $b + c = x$, $b = x - c$. Substitute $(x - c)$ for b in the first equation, and write $a(x - c) = n$, which is Choice (C).
- 14. D.** Possible numbers for G include 3, 6, 12, 15, 21, and so on. If you try multiplying these numbers by 7 and then dividing by 9, you discover that the remainder is always 3 or 6. Because 3 isn't one of the answer choices, the correct answer is 6. Note that the problem asks for which *could* be the remainder.

- 15. 6.** Trial and error can work, but algebra is more reliable. Darren earns 15 dollars per hour on weekdays and $1\frac{1}{2} \times 15 = 22.50$ dollars per hour on weekends. If d equals his weekday hours and e equals his weekend hours, then $15d + 22.5e = 315$. Because $d + e = 18$ (his total hours), use substitution: $d = 18 - e$, so place $(18 - e)$ for d in the other equation:

$$\begin{aligned} 15d + 22.5e &= 315 \\ 15(18 - e) + 22.5e &= \\ 270 - 15e + 22.5e &= \\ 270 + 7.5e &= 315 \\ 7.5e &= 45 \\ e &= 6 \end{aligned}$$

He worked 6 hours during the weekends. Just like that.

- 16. 40.** Sixty-five percent chose history or English, leaving 35 percent for other subjects. This 35 percent represents 14 students, so the question is, "35 percent of x is 14?" Set it up like this and solve for x :

$$\begin{aligned} \frac{14}{x} &= \frac{35}{100} \\ 35x &= 1,400 \\ x &= 40 \end{aligned}$$

- 17. 6.** Copy down the equation and solve for x . First square both sides, and when you remove the absolute value, remember the expression has both the positive and negative values:

$$\begin{aligned} \sqrt{|x+3|} &= 3 \\ |x+3| &= 9 \\ x+3 &= 9, -9 \\ x &= 6, -12 \end{aligned}$$

Because $x \geq 0$, it can only be 6.

- 18. 1 or 3.** Because both expressions equal y , set the expressions equal to each other and solve for x :

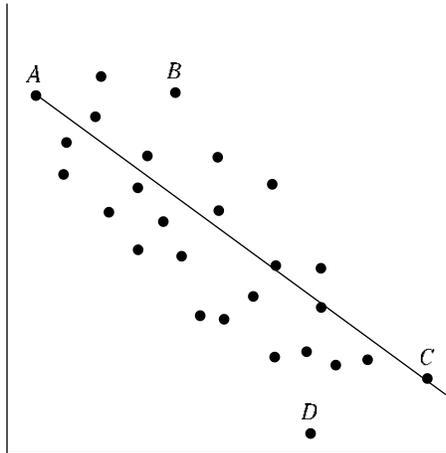
$$\begin{aligned} x^2 - 2x + 6 &= 2x + 3 \\ x^2 - 4x + 3 &= 0 \\ (x-3)(x-1) &= 0 \\ x &= 1, 3 \end{aligned}$$

Because x could equal 1 or 3, type in either 1 or 3, and either answer is considered correct.

- 19. 520.** If the fee for each person is the same amount, and the difference in the total cost between 8 people and 10 people is \$50 (because), then each addition of 2 people adds \$50 to the total price, and each person costs an extra \$25. So 10 people cost \$320, and the additional 8 people add \$200 to the price (because $8 \times 25 = 200$). Add the new \$200 to the existing \$320 for 10 people, and 18 people cost \$520.

20. C. Direct proportion problems require a ratio — in this case, the ratio of volume to temperature. Thus, you can write $\frac{CC_1}{K_1} = \frac{CC_2}{K_2}$ and $\frac{31.5}{210} = \frac{x}{300}$. Cross-multiply to get $210x = 9,450$, and divide by 210 to get $x = 45$.

21. B. This scatter plot shows a negative trend, so the line of best fit would go roughly from the top left to the bottom right. However, point *D* is significantly lower than the rest of the points. If you try drawing a line between *A* and *D*, or *B* and *D*, you'll see that it's really not that close to a lot of the points. However, the line from *A* to *C* is a good approximation of the scatter plot as a whole, as you can see in this diagram.



22. 500. Siva's two investments total \$1,200, so set x as the amount earning 5 percent and $(1,200 - x)$ as the amount earning 7 percent. Five percent of x plus 7 percent of $(1,200 - x)$ equals \$74, so set the equation up like this:

$$5\%(x) + 7\%(1,200 - x) = 74$$

Turn 5% and 7% into decimals 0.05 and 0.07, respectively, and solve for x :

$$0.05(x) + 0.07(1,200 - x) = 74$$

$$0.05x + 84 - 0.07x = 74$$

$$-0.02x = -10$$

$$x = 500$$

Because x represents the number of dollars earning 5 percent, the answer is 500.

Answer Key

Section 1: Reading and Writing, Module 1

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

Section 2: Reading and Writing, Module 2

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

Section 3: Math, Module 1

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|----|---|-----|---|-----|----|-----|-----|
| 1. | B | 7. | A | 13. | C | 19. | 360 |
| 2. | C | 8. | C | 14. | B | 20. | C |
| 3. | B | 9. | C | 15. | C | 21. | D |
| 4. | C | 10. | A | 16. | 96 | 22. | 3 |
| 5. | D | 11. | D | 17. | 7 | | |
| 6. | A | 12. | D | 18. | 84 | | |

Section 4: Math, Module 2

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|----|---|-----|---|-----|--------|-----|-----|
| 1. | D | 7. | A | 13. | C | 19. | 520 |
| 2. | B | 8. | B | 14. | D | 20. | C |
| 3. | A | 9. | A | 15. | 6 | 21. | B |
| 4. | A | 10. | A | 16. | 40 | 22. | 500 |
| 5. | C | 11. | D | 17. | 6 | | |
| 6. | D | 12. | D | 18. | 1 or 3 | | |