

## Reading and Writing Test

27 QUESTIONS | 32 MINUTES

### DIRECTIONS

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

1

The idea of a credit card was first proposed in 1887 by Edward Bellamy in a novel titled *Looking Backward*. Different institutions offered cards for limited purposes after that, but the first modern credit card with revolving payments was \_\_\_\_\_ in 1958 by Bank of America in Fresno, California.

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

- A) dispatched
- B) issued
- C) consigned
- D) allocated

2

The following text is adapted from Jane Austen's 1811 novel, *Sense and Sensibility*.

Mr. John Dashwood told his mother again and again how exceedingly sorry he was that she had taken a house at such a distance from Norland as to prevent his being of any service to her in removing her furniture. He really felt conscientiously vexed on the occasion; for the very exertion to which he had limited the performance of his promise to his father was by this arrangement rendered impractical. Instead, the furniture was all sent around by water.

As used in the text, what does the word "removing" most nearly mean?

- A) transferring
- B) detaching
- C) dismissing
- D) separating

3

Caravaggio was an Italian painter active around 1600. His style was very distinct and enchanting, combining realism and high lighting contrasts in a way that added drama and intensity to the scenes portrayed. His peculiar use of shadow was a prime influence on the work of later generations of Baroque artists who also explored artistic extremes.

As used in the text, what does the word “peculiar” most nearly mean?

- A) singular
- B) abnormal
- C) indisposed
- D) discernible

4

The parents of the first female self-made millionaire, Madam J. Walker, were slaves, but she made a fortune selling cosmetics and hair care products. Throughout her life, she supported Black organizations and artists. Her philanthropy continued after her death, as two-thirds of her legacy was set aside to \_\_\_\_\_ charities.

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

- A) enforce
- B) concede
- C) endow
- D) accord

5

The following text is adapted from Alexandre Dumas's 1849 novel, *The Three Musketeers*.

It was, then, into the midst of this tumult and disorder that our young man advanced with a beating heart, ranging his long rapier up his lanky leg, and keeping one hand on the edge of his cap, with that half-smile of the embarrassed provincial who wishes to put on a good face. When he had passed one group he began to breathe more freely; but he could not help observing that they turned round to look at him, and for the first time in his life D'Artagnan, who had till that day entertained a very good opinion of himself, felt ridiculous.

What is the main purpose of the underlined portion in the overall structure of the text?

- A) It warns the reader of a coming conflict.
- B) It indicates a temporal change in the passage.
- C) It describes the appearance of a scene.
- D) It stresses the emotional state of a character.

6

The following text is from Leo Tolstoy's 1873 novel, "Anna Karenina."

Levin had meant to tell his brother of his determination to get married, and to ask his advice; he had indeed firmly resolved to do so. But after seeing his brother, listening to his conversation with the professor, hearing afterwards the unconsciously patronizing tone in which his brother questioned him about agricultural matters, Levin felt that he could not for some reason begin to talk to him of his intention of marrying. He felt that his brother would not look at it as he would have wished him to.

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

- A) It explains the purpose of the conversation with the professor.
- B) It adds to the sense of inferiority which causes Levin to change his mind.
- C) It elaborates on an obstacle preventing Levin from getting married.
- D) It introduces a problem that Levin and his brother frequently disagreed about.

7

**Text 1**

On August 5, 2013, a live television broadcast from London showed two food critics tasting a hamburger patty cooked by chef Richard Geown. The importance of this event was that the hamburger was the first public tasting of cultured meat, meaning meat that was raised from cells in a laboratory. This sample took two years and cost \$300,000 to produce, but its creator, Mark Post, is sure there is potential for such foods in the market.

**Text 2**

Cultured meat is regarded with skepticism in many circles. Will people readily consume animal meat raised in a laboratory? No animals are slaughtered, but the concept is still repulsive to many. Even so, many companies are jumping on the bandwagon to produce different meats, and the first sales occurred in December 2020, when a Singapore restaurant included cultured meat in its offerings.

Which choice best describes the relationship between the texts?

- A) Text 1 describes the introduction of a product, and Text 2 explains later developments.
- B) Text 1 describes the positive reception of a product, and Text 2 brings up reservations.
- C) Both texts refer to the difficulty in creating a new product.
- D) Both texts discuss the public's reaction to a new product.

8

**Text 1**

Prior to 1972, polar bear populations were severely reduced by hunters and trappers, causing concern about the survival of the majestic apex species. However, an international agreement regulating commercial hunting enacted in 1973 changed odds against the hearty animals. Now, the total number of polar bears has rebounded to healthy levels that demonstrate that the species is no longer in imminent danger of extinction.

**Text 2**

Sea ice is essential for all parts of the polar bear lifecycle—and it is melting at a faster rate than ever before due to climate change. It is important to note that as of 2019, although two of the nineteen known populations increased in numbers, four had declined and there was not enough data on eight.

Based on the texts, after his experiments, how would the author of Text 2 most likely describe the view of the author of Text 1?

- A) Limited, because it only addresses one aspect of the threats against polar bears.
- B) Inspiring, because it provides evidence that polar bear populations are increasing.
- C) Erroneous, because it inaccurately reported the total number of polar bears.
- D) Worrisome, because it hints that efforts to protect polar bears are only partially successful.

9

A very rare meteorological event is called thundersnow. This uncommon event occurs when there are strong updrafts in cold weather. The mechanics are basically the same as those which cause thunderstorms, but the results are lightning and thunder with falling snow or hail instead of rain. Thundersnow clouds tend to be lower than thunderstorm clouds, and the effect is most common over large bodies of water like the Great Lakes in the Northwestern United States and Utah's Great Salt Lake, though they can occur elsewhere. Often the sounds of the thunder are muted due to the presence of snow.

What is the main purpose of the text?

- A) It explains an unusual phenomenon.
- B) It identifies locations to see a phenomenon.
- C) It describes why a phenomenon occurs.
- D) It outlines a scientific dilemma.

10

This passage is adapted from Mark Twain's 1903 story, "The \$30,000 Bequest."

Saladin's wife, Electra, was a capable helpmeet, although—like himself—a dreamer of dreams and a private dabbler in romance. The first thing she did after her marriage was buy an acre of ground on the edge of the town, and pay cash for it—twenty-five dollars, all her fortune. Saladin had less, by fifteen. She instituted a vegetable garden there, and got it farmed on shares by the nearest neighbor. Out of Saladin's first year's wage she put thirty dollars in the savings-bank, sixty out of his second, a hundred out of his third. By the time two children had arrived, she banked two hundred a year from the salary. When she had been married seven years, she built a pretty and comfortable house in the midst of her garden-acre and moved her family in.

What is the main idea of the text?

- A) Electra was more capable at finances than her husband was.
- B) Electra and Saladin were too romantic to be practical.
- C) Saladin was taking advantage of Electra's money.
- D) Electra has excellent thrift and planning ability.

11

John Milton is one of the most famous poets from the 1600s. Though his writing is sometimes archaic to modern readers, the sentiments still ring close to the heart. For instance, he claims at the preface of his 1637 poem “Lycidas” that “the Author bewails a learned Friend”: \_\_\_\_\_

Which quotation from “Lycidas” most effectively illustrates the claim?

- A) “YET once more, O ye Laurels, and once more / Ye Myrtles brown, with Ivy never-sear, / I com to pluck your Berries harsh and crude,”
- B) “For we were nurst upon the self-same hill, / Fed the same flock by fountain, shade, and rill.”
- C) “But O the heavy change, now thou art gon, / Now thou art gon, and never must return!”
- D) “Fame is the spur that the clear spirit doth raise / (That last infirmity of Noble mind) / To scorn delights, and live laborious days”

12

Training working dogs is a complicated process. Typical pets need to follow commands given by the owners. However, working dogs are also expected to use *selective disobedience*. This term refers to a situation when the dog is given a direct command by the owner which may lead to injury to either the owner or the dog. In such a case, the dog must use its own judgment and disobey rather than blindly following the command that the owner gave it.

Which situation is the best example of selective disobedience as defined in the text?

- A) A dog that herds cows rests in the shade of a tree on a hot day while the cows are grazing, even though the owner asked the dog to stand by the cows.
- B) A guide dog for the blind refuses to lead the owner onto a street when a truck is approaching and the owner asks to cross.
- C) A dog that is trained to rescue victims of earthquakes is approaching a building that may collapse and stops when the owner signals that it is dangerous.
- D) A dog trained to help a hearing-impaired owner does not alert the owner when the phone rings and the owner is napping on the couch.

| Main Employers of Urban and Regional Planners in the United States, 2018 |     |
|--|-----|
| Local government   | 71% |
| Architectural, engineering, and related services                         | 11  |
| State government   | 9   |
| Management, scientific, and technical consulting services                | 3   |
| Federal government   | 2   |

Employment of urban and regional planners is projected to grow 11 percent from 2018 to 2028, much faster than the average for all occupations. Demographic, transportation, and environmental changes will drive employment growth for planners. Within cities, urban planners will be needed to develop revitalization projects and address issues associated with population growth, environmental degradation, the movement of people and goods, and resource scarcity. Planners will also be needed as new and existing communities require extensive development and improved infrastructure, including housing, roads, sewer systems, parks, and schools. However, federal, state, and local government budgets may affect the employment of planners in government, because development projects are contingent on available funds.

Based on the text, what can be reasonably inferred about the percentage of urban and regional planners employed by the federal government in the table?

- A) The percentage is extremely low because there is very little demand for urban planning outside of large cities.
- B) The percentage does not reflect the actual number of planners employed by the federal government compared to those employed in other sectors.
- C) The percentage will remain approximately the same level because federal government positions are very stable.
- D) The percentage has the potential to decrease if the federal government receives fewer tax dollars and revises its spending plans.

14

The following text is adapted from Mary Wollstonecraft Shelley's 1818 novel, *Frankenstein; Or, the Modern Prometheus*.

We sat late. We could not tear ourselves away from each other nor persuade ourselves to say the word "Farewell!" It was said, and we retired under the pretence of seeking repose, each fancying that the other was deceived; but when at morning's dawn I descended to the carriage which was to convey me away, they were all there—my father again to bless me, Clerval to press my hand once more, my Elizabeth to renew her entreaties that I would write often and to bestow the last feminine attentions on her playmate and friend.

Based on the text, what is most likely true about the narrator?

- A) The narrator is a woman who grew up with Elizabeth.
- B) The narrator is leaving home for the first time.
- C) The narrator was trying to avoid the end of the journey.
- D) The narrator will be absent for a long period.

15

Clark and McLachlan examined existing data on pollen from red maple, birch, beech, ash, oak, hemlock and elm trees isolated from cores of lake sediments in southern Ontario. "This record covers about 10,000 years, so if we look at the relative abundance of different species over that time, we can estimate long-term growth rates," said Clark. "What found is huge variability within populations, and this variability means they overlap in ways that determine who's going to win and who's going to lose. And that variability might itself represent a stabilizing mechanism." Clark emphasized that the results from the studies offer cautionary lessons. "Our findings suggest that forest biodiversity has been stabilized in some important ways, so extinction of species should cause us greater concern than if we believed that biodiversity was maintained in the past by continual replenishment of random extinction by generation of new species."

Based on the text, what is one implication of Clark's study regarding the result of biodiversity stabilization?

- A) There is a smaller chance of ecosystems collapsing than previously theorized.
- B) Extinction is a random event that is compensated for by evolution of new species.
- C) As time progresses, fewer new species will evolve than did in the past.
- D) An extinction could indicate a larger-scale collapse of the region's equilibrium.

16

Kinkaku-ji, also known as the Golden Pavilion, is one of the most popular tourist sites in Kyoto despite having been completely destroyed in a fire set by an arsonist in 1950; a replica was later rebuilt on the same pattern as the original.

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

- A) completely destroying
- B) it was destroyed completely
- C) to have been completely destroyed
- D) having been completely destroyed

17

Many people think of the world's largest cats, lions, and tigers, as living together in the same region. In reality, the only country where they coexist is India, and even there, the two species prefer \_\_\_\_\_ different habitats.

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

- A) extreme
- B) extremity
- C) extremely
- D) extremist

18

First performed in England in 1984, \_\_\_\_\_ It is most notable because all the cast sing and act their parts on roller skates.

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

- A) Richard Stilgoe and Andrew Lloyd Webber wrote the lyrics and music, respectively, for the musical *Starlight Express*.
- B) Richard Stilgoe wrote the lyrics for *Starlight Express* and Andrew Lloyd Webber wrote the music.
- C) Andrew Lloyd Webber wrote the music and Richard Stilgoe wrote the lyrics for the musical *Starlight Express*.
- D) *Starlight Express* is a musical with lyrics by Richard Stilgoe and music by Andrew Lloyd Webber.

19

A survey is a process of collecting a small but representative sampling of responses on a given topic and extrapolating that information to what a larger group might think about it, since many \_\_\_\_\_ fall into basic patterns when looked at as a whole.

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

- A) peoples' opinions
- B) people's opinions
- C) people's opinions'
- D) peoples' opinions'

20

The sousaphone—invented in 1893 by J.W. Pepper at the request of band leader John Philip \_\_\_\_\_ a brass instrument related to the tuba and often used in marching bands because it is easier to carry and directs sound over the head of other band members.

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

- A) Sousa is
- B) Sousa is—
- C) Sousa, is
- D) Sousa—is

21

There has been scholarly debate about the exact definition of Aztec, but it loosely refers to a culture that flourished in Mexico between approximately 1300 and 1521. The Aztec Empire was formed in 1427 of three separate \_\_\_\_\_ Tlacopan.

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

- A) city-states: Tenochtitlan, Texcoco, and,
- B) city-states: Tenochtitlan; Texcoco; and
- C) city-states Tenochtitlan, Texcoco, and
- D) city-states, Tenochtitlan, Texcoco, and

22

In 1961, Jenny Johnson wrote the beloved poem “Warning,” which is now best known by its first \_\_\_\_\_ I am an old woman, I shall wear purple.

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

- A) line “when
- B) line, “when
- C) line, those are “when
- D) line, it is “when

23

Many researchers have identified a correlation between the consumption of nuts and longevity. \_\_\_\_\_ it has yet to be established whether the nuts actually impact lifespan or whether people who already have healthier lifestyles tend to include nuts in their diets.

Which choice completes the text with the most logical transition?

- A) Therefore,
- B) However,
- C) Indeed,
- D) Similarly,

24

The Egyptian leader known as King Tut died around 1323 B.C. when he was only 18 or 19 years old. Archaeologists debate over the cause of his death, saying it could have been caused by malaria, a hippopotamus attack, a chariot race injury, or murder. \_\_\_\_\_ the death was unexpected: he was buried in a tomb that was designed for another person.

Which choice completes the text with the most logical transition?

- A) Therefore,
- B) As a result,
- C) Alternatively,
- D) In any event,

25

After Christopher Columbus's ships were stranded in Jamaica, the indigenous people grew tired of providing food and Columbus was worried about the safety of his crew. \_\_\_\_\_ he used information from an almanac about an upcoming lunar eclipse to intimidate the natives.

Which choice completes the text with the most logical transition?

- A) Nevertheless,
- B) In other words,
- C) Likewise,
- D) Therefore,

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

- B.F. Keith lived from 1846 to 1914 and owned and operated hundreds of vaudeville theaters around the United States.
- Keith did not approve of the common theatrical trend of vulgarity and insisted that his performers offered decent acts with no swear words.
- The theaters were lavish and entertained spectators with their palace-like, elegant ornamentation, as opposed to simple structures of older theaters.
- Ushers had authority to remove audience members who heckled the performers.
- Edwin Albee was Keith's invaluable partner and assumed control of the theaters after Keith's death.

The student wants to emphasize what differentiated Keith's theaters from others at the time. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- A) B.F. Keith (1846–1914) owned more theaters than others in the era and built ones that were extremely ornamented.
- B) Compared to other theaters in that period, B.F. Keith's theaters offered more polite performances and the theaters themselves were very elaborate.
- C) B.F. Keith ran vaudeville shows rather than other performances until his death in 1914, when Edwin Albee took over his hundreds of elegant theaters.
- D) B.F. Keith disapproved of acts with swear words or audiences that heckled performers, so prohibited those in his gorgeously ornamented theaters.

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

- There are about 2–4 partial lunar eclipses a year, and they are visible from about half of the Earth.
- Lunar eclipses occur when the Earth is between the Sun and Moon, and therefore casts a shadow across the Moon's surface.
- A blood moon occurs only during a total lunar eclipse and may last up to two hours.
- A total lunar eclipse begins with an increasingly smaller white crescent as more and more light from the Sun is blocked and ends with the reverse, a crescent that grows larger.
- The blood moon occurs only when the entire moon is in shadow.
- The sunrise or sunset that is visible at the edge of the Earth gives the blood moon its red color.

The student wants to explain what a blood moon is to an audience that knows about lunar eclipses. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- A) A lunar eclipse is when the shadow of the Earth crosses the Moon, starting with a white crescent, turning into a blood moon, and ending with another crescent.
- B) A full lunar eclipse has a phase called the blood moon, which is when the entire Moon is in shadow and the light from around the edges of the Earth color the Moon red.
- C) Lunar eclipses happen 2–4 times a year when the Earth passes between the Sun and the Moon, but a total lunar eclipse is called a blood moon.
- D) Blood moons occur during a total lunar eclipse when the Earth blocks all but the red light from the Sun, which shines through to color the moon.

**No Test Material On This Page**

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### DIRECTIONS

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

1

Though her invention was originally mocked as foolish, Marion Donovan \_\_\_\_\_ childcare by inventing the disposable diaper, freeing housewives from hours of labor. In the past, women had to not only clean the diaper but also furniture and clothes when the cloth padding leaked. The disposable diaper's absorbent padding and close-fitting cover completely changed how babies could be raised.

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

- A) rebuilt
- B) reorganized
- C) reclassified
- D) revolutionized

2

In the experiment, the date of appearance of the first flowers was noted for each treatment of salt that stressed the plant; thus, the number of days it took for each plant to make its first flower from the start of the stress application was covered. Fruit ripening, number, size, and fresh mass were also evaluated.

As used in the text, what does the word "application" most nearly mean?

- A) significance
- B) diligence
- C) request
- D) execution

3

James Abbot McNeill Whistler's famous 1871 painting known as *Whistler's Mother* has been considered one of the classics of American art. Originally titled *Arrangement in Grey and Black #1*, the strong composition of Anna Whistler exemplifies the artist's \_\_\_\_\_ at manipulating subtle colors.

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

- A) susceptibility
- B) adroitness
- C) engagement
- D) diversion

4

The popular 1943 film *Lassie Come Home* was based on a book written in 1940 by Eric Knight about a female dog named Lassie who had a deep emotional connection with the boy who owned her. The fictional dog was supposedly first introduced in an earlier short story that Knight wrote. However, in 1859, Elizabeth Gaskell published "The Half Brothers," a similar short story featuring a dog named Lassie that saved two boys lost in a snowstorm.

What is the main purpose of the underlined portion in the overall structure of the text?

- A) It casts doubt on the veracity of a claim.
- B) It questions the similarity between two stories.
- C) It emphasizes that a character was fictional.
- D) It highlights the popularity of an earlier work.

5

Spike Lee is a movie director known for his nuanced depictions of Black characters, but in the past, movies were far less sensitive about the multiple facets of people of color. The first Black man who starred in a major motion picture was Sam Lucas, who played a role in the 1914 production of *Uncle Tom's Cabin*. Prior to that time, Black characters were played by White actors in face paint. Throughout the following years, Black actors received roles, but primarily as maids, servants, or jungle savages, until the late 19th century, when daring directors pushed the stereotyped boundaries.

What is the primary function of the underlined portion in the overall structure of the text?

- A) It hints that a common stereotype is flawed.
- B) It offers an example to use as a comparison.
- C) It introduces the person who pioneered a change.
- D) It brings up a problem that took time to resolve.

6

Mas Subramanian, a solid-state materials scientist, was trying to create a magnetic substance that could be used in computer hard drives. One of his creations was not at all magnetic, but instead was a bright shade of blue. Subramanian realized that every cloud has a silver lining and started to find ways to market the new pigment. As opposed to most other sources of blue, his material was stable and non-toxic.

What is the main purpose of the phrase “every cloud has a silver lining”?

- A) To provide a metaphor showing that the material was gaseous like a cloud
- B) To indicate that Subramanian realized that the seeming failure had benefits
- C) To establish that the pigment could be used to make silver as well as blue
- D) To show that the material could be rendered magnetic by adding other substances

Text 1 is adapted from Charles Stearns's 1849 treatise, "The Way to Abolish Slavery."  
Text 2 is adapted from Catharine Beecher's 1837 letter, "Slavery and Abolitionism, with Reference to the Duty of American Females."

**Text 1:**

The Government of the United States creates no Slaves; it only recognises as lawful the Slavery existing in the several States, or to use the words of the Constitution, "held to service or labor, under the laws thereof." The *laws* of the several slave-holding States are made the standard for the general government's action upon this subject. No quibble can possibly evade this, for it is not necessary to prove that a runaway Slave justly owes service to his master, but only if he does, under *the laws of his master*. What then is necessary to be done to remove this prop from under the colossal statue of Slavery? Plainly, to repeal all laws recognising its existence.

**Text 2:**

Now what is it that makes a man cease to be a slave and become free? It is not kind treatment from a master; it is not paying wages to the slave. It always signifies *that legal* act, which, by the laws of the land, changes a slave to a freeman. No exception can be made for those who live in States where the act of emancipation, by a master, makes a slave the property of the State, to be sold for the benefit of the State.

Which choice best describes how Stearns (Text 1) would most likely react to Beecher's (Text 2) assertion that some slaves are not freed because they live in states that consider emancipated slaves the property of the state?

- A) Stearns would argue that such a case is only possible with adequate paperwork.
- B) Stearns would argue that is one more reason that all slavery laws should be eliminated.
- C) Stearns would argue that slavery is an integral part of the U.S. Constitution.
- D) Stearns would argue that if such slaves left the state, they would then be free.

8

Coywolves first appeared in the early part of the 20th century near Canada's Algonquin Provincial Park. They are hybrids between wolves and western coyotes; some studies have also identified genetic material from domestic dogs in coywolves. They are extremely adaptable to a wide variety of habitats and are now flourishing in different areas. Biologists estimate that there may be over one million coywolves dispersed across Eastern North America from Canada to Virginia. In general, the coywolf has a larger body, longer legs, shorter ears, and a larger, stronger jaw than a regular coyote.

Based on the text, what is true about coywolves?

- A) They are more common in Canada than other places.
- B) They are more closely related to coyotes than wolves.
- C) They were hybridized by Canadian people in the early 20th century.
- D) They may be found in different environmental conditions.

9

Jessica Nabongo is the first black woman known to have visited all 195 countries in the world; she has been to 10 different territories as well. The last country on her list was the Seychelles, which she visited in 2019. During her travels, she was appalled by the poverty and at the way poor countries supported the burden of the world's waste. Now Nabongo, who is Ugandan-American, is an advocate for ethical and sustainable travel, and has written a book about her adventures called *The Catch Me If You Can*.

According to the text, what is true about Jessica Nabongo?

- A) She was born in Uganda and moved to America.
- B) She is the author of a book about traveling around the world.
- C) She visited 195 countries before visiting 10 territories.
- D) She felt that the Seychelles had too much poverty.

10

The automobile company Volkswagen proposed an advertising campaign called The Fun Theory under the assumption that the best way to change people's behaviors was by adding an element of fun. To test the theory, researchers measured the number of passengers in a Swedish subway station who were willing to walk on stairs that made piano sounds for every step as opposed to a regular escalator next to it. Measuring use before and after converting the staircase, results indicated a 66% increase.

Which choice best states the main idea of the text?

- A) Volkswagen has created an effective new advertising strategy.
- B) People are willing to change behaviors when fun is used as an incentive.
- C) More people prefer taking stairs to using an escalator.
- D) Staircases should be converted so that they sound like a piano.

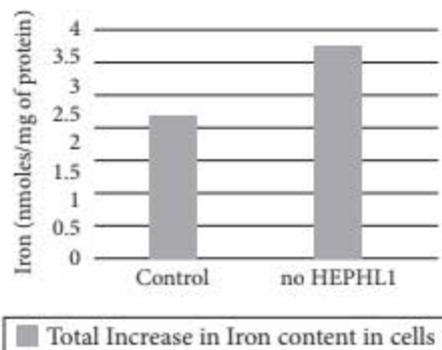
11

Argentina's Iguazu National Park contains one of the most spectacular waterfalls in the world. Water drops in multiple cascades up to 80 meters high, forming a crescent about 2,700 meters in diameter. Named a national park in 1934 and a UNESCO World Heritage Site in 1984, the park is considered a world treasure for more than its beauty: \_\_\_\_\_

Which quotation most effectively illustrates the claim?

- A) its conservation has a generous budget and is conducted by rangers and other professionals.
- B) it is located on a basaltic line that forms the border between Argentina and Brazil.
- C) the spray from the falls creates a unique microclimate with over 2,000 species of plants.
- D) most of the region has been severely altered due to logging and agriculture.

Total Increase in Iron Content in Cells

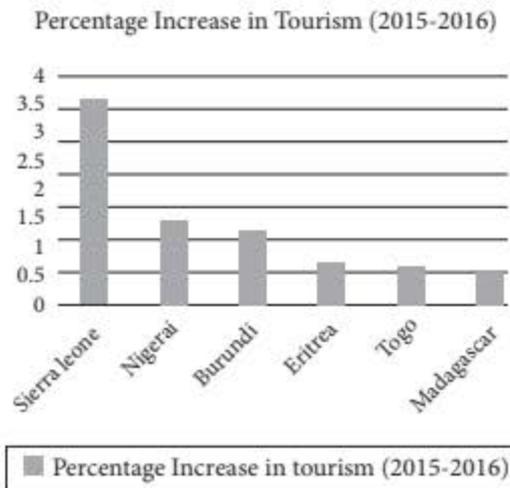


Figures adapted from “Biallelic HEPHL1 variants impair ferroxidase activity and cause an abnormal hair phenotype” by Prashant Sharma et al., PLOS Genetics, 2019.

HEPHL1 belongs to a family of proteins known as Multi-Copper Oxidases (MCOs) that catalyze the oxidation of iron so that it can bind to a circulating protein called transferrin which distributes the iron throughout the body. One unique property of MCOs is the presence of three copper-binding sites that can house six copper atoms. To help us explore the physiological consequences of the loss of HEPHL1 activity more thoroughly, we used a gene-targeting approach to make mice with a disrupted *Heph1l* gene. Interestingly, all mice that had a complete deletion of both copies of their *Heph1l* gene had short, curled whiskers throughout their life. We found that the iron uptake increase between the cells of the mouse with no HEPHL1 and the cells of the control mouse was significant: \_\_\_\_\_.

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

- A) about 1.1 nmoles/mg of protein
- B) at almost 2.1 nmoles/mg of protein
- C) nearly 2.7 nmoles/mg of protein
- D) around 3.8 nmoles/mg of protein



Data for figures is adapted from African Development Bank Group, 2016

Every African country, urban center, or rural village could be, in fact, its own unique tourism magnet. The tourism business, though, is broader than just the sites themselves. Considerations need to be made for transportation, hotels and guest accommodations, and services that link the various components of a trip, such as guide services in national parks or city bus tours. The attractiveness and competitiveness of each tourism destination will depend on the site's quality and accessibility.

Which of the following claims about tourism is best supported by the text and data from the graph?

- A) Almost 50% of the visitors who traveled to Africa in 2016 went to Nigeria.
- B) Sierra Leone probably invested more in the infrastructure of tourism by 2016 than Togo did.
- C) Burundi had over 40% more visitors than Eritrea or Togo in 2016.
- D) Eritrea had a greater number of tourists who visited in 2016 than Madagascar did in the same year.

14

The following text is adapted from Jack London's 1903 novel, *The Call of the Wild*.

Buck did not read the newspapers, or he would have known that trouble was brewing, not alone for himself, but for every tide-water dog, strong of muscle and with warm, long hair, from Puget Sound to San Diego. Because men, groping in the Arctic darkness, had found a yellow metal, and because steamship and transportation companies were booming the find, thousands of men were rushing into the Northland. These men wanted dogs, and the dogs they wanted were heavy dogs, with strong muscles by which to toil, and furry coats to protect them from the frost.

Based on the text, what is implied about Buck?

- A) He is aboard a steamship headed north.
- B) He found gold in the northland.
- C) He owns a dog that is needed in the north.
- D) He is a strong dog able to tolerate cold.

15

In a powerful 2020 book, Moroccan-American writer Laila Lalami argues the case for citizens that are \_\_\_\_\_, meaning people who the government accepts as members of the society on one hand, but refuses to grant complete rights to on the other.

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

- A) conditions
- B) conditional
- C) conditionally
- D) conditioner

16

Built between 1960 and 1970 in Egypt, the Aswan Dam, now known as the Aswan High Dam, was erected across the Nile River to control flooding, increase water storage, and \_\_\_\_\_

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

- A) generate hydroelectricity.
- B) it generates hydroelectricity.
- C) hydroelectricity is also generated.
- D) to generate hydroelectricity.

17

The Audubon Society was named for one of the most eminent early American ornithologists, John James Audubon. Though Audubon himself made drawings of dead birds, members of the society \_\_\_\_\_ to the conservation of birds and their habitats.

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

- A) is dedicated
- B) are dedicated
- C) dedicating
- D) has been dedicated

18

Almost all of the paintings by the Italian Baroque painter Artemisia Gentileschi feature naturalistic women as the focus. Artemisia herself broke the standard model for women at the time, earning a living as a professional artist. Therefore, it is not surprising that her subjects are also courageous, rebellious, and \_\_\_\_\_.

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

- A) powerful
- B) they have power
- C) possess power
- D) are powerful

19

Popular since the 1700s, *shichimi* (Japanese for “seven spices”) is the name of a spice compound made, as the name suggests, from seven spices, though the exact composition varies.

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

- A) *shichimi* (Japanese for “seven spices”)
- B) *shichimi* , (Japanese for “seven spices”)
- C) *shichimi* (Japanese for “seven spices”),
- D) *shichimi* , (Japanese for “seven spices”),

20

Dinosaurs lived on Earth for about 165 years until the Cretaceous Period, so many of the familiar \_\_\_\_\_ were actually separated by long periods of time.

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

- A) species like stegosaurus and tyrannosaurus
- B) species, like stegosaurus and tyrannosaurus
- C) species, like stegosaurus, and tyrannosaurus,
- D) species like: stegosaurus and tyrannosaurus

21

Saturn's moon Europa has an extremely smooth surface which indicates that there may be a water ocean beneath \_\_\_\_ such an ocean could theoretically exist despite the extremely cold temperatures due to the gravitational pull of Saturn.

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

- A) it
- B) it,
- C) it;
- D) it. And

22

The Frank Lloyd Wright building of the Guggenheim Museum is an architectural masterpiece best known for its Grand Ramp, a gentle spiral walkway that leads the visitor to every floor in a stately manner. What is little known is that as the plans evolved over the sixteen years of \_\_\_\_ was eliminated from the design.

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

- A) construction, a smaller, much steeper ramp
- B) construction a smaller, much steeper ramp,
- C) construction a smaller, much steeper, ramp
- D) construction a smaller much steeper ramp

23

Seeing eye dogs require the most rigorous training of all forms of working dogs. \_\_\_\_ they must learn to alert their handlers to potential dangers that could hurt the owner but not necessarily the dog, such as walking under a low branch.

Which choice completes the text with the most logical transition?

- A) Nevertheless,
- B) Therefore,
- C) Specifically,
- D) Similarly,

24

"Civil disobedience" is a term popularized in the United States by Henry David Thoreau's essay *Civil Disobedience*. That publication inspired Mahatma Gandhi in the 1920s to actively refuse to obey the laws of India in a non-violent way. \_\_\_\_ Martin Luther King, Jr., used similar techniques to promote the Civil Rights Movement in the United States in the 1960s.

Which choice completes the text with the most logical transition?

- A) In conclusion,
- B) Subsequently,
- C) For instance,
- D) Nonetheless,

25

Cashews are popular nuts eaten as snacks around the world, but are not sold in the shells, because the shells contain caustic oil compounds that trigger contact dermatitis. \_\_\_\_\_ the shell creates a rash on the skin.

Which choice completes the text with the most logical transition?

- A) In other words,
- B) Likewise,
- C) Conversely,
- D) On the other hand,

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

- Heat islands are urban areas that are 1–7 degrees Fahrenheit hotter than the surrounding areas during the day.
- Nighttime temperatures may be 2–5 degrees hotter
- Heat islands are caused by synthetic materials in buildings and roads that absorb and emit more heat than natural areas like plants or water
- The effect can be mitigated by planting trees
- Lightening the color of surfaces such as roofs can reduce the temperature differences.
- Heat islands do not directly increase global warming but can indirectly do so through factors such as using more air conditioners.

The student wants to offer an audience that does not know what a heat island is some practical solutions for reducing the effect. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- A) Heat islands do not increase global warming and their effect can be reduced by using air conditioners.
- B) Heat islands, which are urban areas hotter than their surroundings by up to 7 degrees, are caused by using many synthetic materials in buildings and roads.
- C) Heat islands are 1–7 degrees Fahrenheit hotter during the day and 2–5 degrees hotter at night, but that effect can be reduced by planting trees.
- D) Heat islands, urban areas that are hotter than the surroundings, can be lessened in intensity by steps such as planting trees or painting roofs and other surfaces a lighter color.

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

- Wildlife corridors are areas that are designed to link habitats together.
- The goal is to promote biodiversity and safe movement of species so populations can intermingle and have a larger gene pool rather than become isolated.
- Animals can use wildlife corridors to find food, water, and other resources.
- The concept is consistent with farming, forestry, and conservation efforts because corridors can take different forms.
- Various options include “stepping stones” of native vegetation, bridges for animals to cross roads, and removal of fences around private property.

The student wants to convince people in a farming community to create a wildlife corridor to protect a native species of deer. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- A) We can protect the native deer using a wildlife corridor because it can link habitats for the deer to find food and mates while still allowing farmers to do their jobs.
- B) We can create a wildlife corridor for the native deer so they can thrive and contribute to conservation efforts in the region.
- C) Wildlife corridors are a good solution because they allow the native deer to move around safely, intermingle, and find food, through a system of bridges, native vegetation, and so on.
- D) A wildlife corridor can take different forms and achieve the goal of preserving the gene pool of the native deer species.

.....

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## Math

22 QUESTIONS | 35 MINUTES

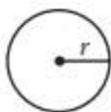
## DIRECTIONS

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

## NOTES

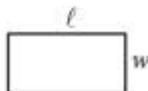
Unless otherwise indicated: • All variables and expressions represent real numbers. • Figures provided are drawn to scale. • All figures lie in a plane. • The domain of a given function is the set of all real numbers  $x$  for which  $f(x)$  is a real number.

## REFERENCE

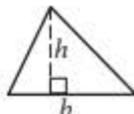


$$A = \pi r^2$$

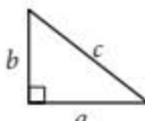
$$C = 2\pi r$$



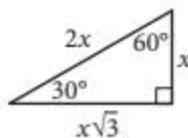
$$A = \ell w$$



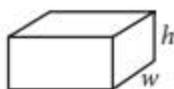
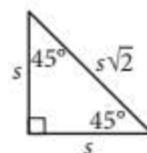
$$A = \frac{1}{2}bh$$



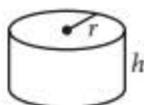
$$c^2 = a^2 + b^2$$



Special Right Triangles



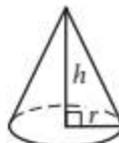
$$V = \ell wh$$



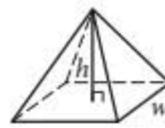
$$V = \pi r^2 h$$



$$V = \frac{4}{3}\pi r^3$$



$$V = \frac{1}{3}\pi r^2 h$$



$$V = \frac{1}{3}\ell wh$$

The number of degrees of arc in a circle is 360.

The number of radians of arc in a circle is  $2\pi$ .

The sum of the measures in degrees of the angles of a triangle is 180.

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

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1

Alley bought a piece of land for \$47,890. It increased in value every year by 2%. Which of the following best describes the model of the price of the land every year after she bought it if  $t$  is the number of years after she bought the land?

- A)  $47,890(1.02)^t$
- B)  $47,890 + 0.02^t$
- C)  $47,890(0.98)^t$
- D)  $47,890(1.02)^t$

2

If  $ax + bx - b + a = 5x - 2$ , what is the value of  $a^2 - b^2$ ?

- A) 3
- B) 5
- C) -10
- D) -2

3

If one of the solutions to the quadratic equation below is  $1 + 2\sqrt{k}$ , what is the value of  $k$ ?

$$y = 3x^2 - 6x - 21$$

4

If the length of a rectangle is 6 cm less than its width  $x$ , what is the length of the rectangle given that its area is  $27\text{cm}^2$ ?

- A) 9
- B) 21
- C) 6
- D) 3

5

Which of the following equations is equivalent to  $7x + 14 = 7$ ?

- A)  $3x + 6 = 3$
- B)  $x - 2 = 1$
- C)  $x = 3$
- D)  $7x = 7$

6

How many possible integer values of  $x$  does the inequality below have?

$$|x + 3| < 7$$

7

The function  $p(x)$  is defined by  $p(x) = \left\{\frac{1}{8}\right\}^{-x}$ ,

what is the value of  $p\left(\frac{1}{3}\right)$ ?

- A) 2
- B) 512
- C)  $\frac{1}{2}$
- D)  $\frac{1}{512}$

8

Which of the following is a factor of  $f(x) = 6x^2 - 17x + 10$ ?

- A)  $6x + 5$
- B)  $x + 5$
- C)  $x - 2$
- D)  $x - 5$

9

Data set A 

 Data set B



Which of the following is true about the two data sets above?

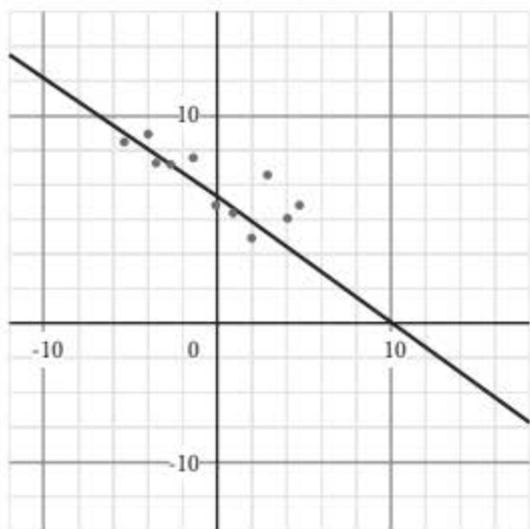
- A) The mean of data set A is less than the mean of data set B
- B) Data set A has more values than data set B
- C) The median of data set A is greater than the median of data set B
- D) The median of data set B is greater than the median of data set A

10

In the  $xy$  plane, the graph of the quadratic function  $f$  is a parabola with the vertex  $(-2, 5)$ . The function  $g(x)$  is defined when the function  $f(x)$  is translated 3 units to the left and 1 unit up. If  $(h, k)$  is the vertex of  $g(x)$ , what is the value of  $h$ ?

11

For how many points does the line of best fit predict a lower value than the actual point?



- A) 11
- B) 5
- C) 6
- D) 3

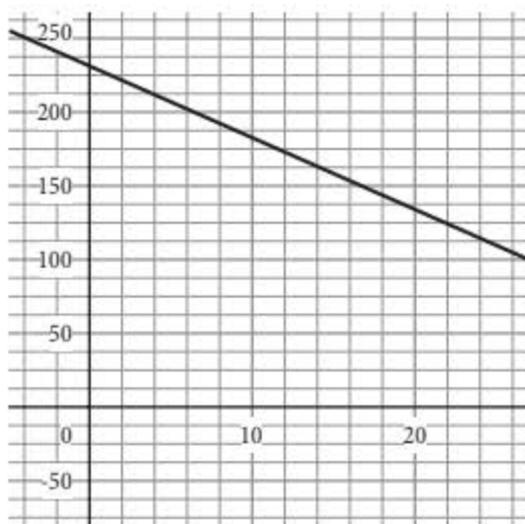
12

For all values of  $x > 0$ , which of the following is equivalent to  $(x + \sqrt{2})^2(x - \sqrt{2})^2$ ?

- A)  $x^2 + 4x + 4$
- B)  $x^4 + 4x^2 - 4$
- C)  $2x^2 + 4$
- D)  $x^4 - 4x^2 + 4$

13

A baker has the graph below which models its daily expenditure for the month of August. Which of the following expressions best describes the equation of the function?



- A)  $y = 231 - 4.85x$
- B)  $y = 231 + 0.85x$
- C)  $y = 4.85x - 231$
- D)  $y = 4.85x + 231$

14

A school has 24 girls and 20 boys. If  $\frac{3}{5}$  of the boys are on the track team and  $\frac{3}{4}$  of the girls are not on the track team, what percentage of the students are on the track team? (round off to the nearest whole number)

15

If  $(a, b)$  are solutions to the system of inequalities below, what is the minimum value of  $b$ ?

$$y > 2(x - 2)^2 - 2$$

$$y \geq -1$$

- A) 2
- B) -2
- C) 0
- D) -1

16

Which of the following equations is equivalent to  $2x^2 + 28x = -98$ ?

I.  $2(x + 7)^2 = 0$

II.  $2(x - 7)^2 = 0$

- A) I
- B) All of them
- C) II
- D) Neither of them

17

$$3y - 2x = 6$$

$$5y - 4x = 8$$

If the system of equations above has a solution  $(x, y)$ , what is the value of  $2x + y$ ?

18

A survey was conducted in a school on the change of uniforms. The conclusion of the survey was that 53 students of the 97 students surveyed are in favor of the proposed change. If there are 2,300 students in the school, approximately how many students are not in favor of the change in school uniform?

- A) 1,256
- B) 1,043
- C) 2,300
- D) 1,093

19

If the system below has no solution, what is the value of  $p$ ?

$$y = 3x + 5 - \frac{8}{3}(x + 3) \text{ and } y = px + 4$$

- A) 1
- B)  $\frac{1}{3}$
- C)  $\frac{5}{3}$
- D)  $\frac{2}{3}$

20

If the system below has infinite solutions, what is the value of  $k$ ?

$$y = 5(x - 2) + x + 3 \text{ and } y = k(x - 2) + 2x + 1$$

21

A square is inscribed in a circle. If the circle has a radius of  $12\text{cm}$ , what is the length of one side of the square?

- A) 24
- B) 12
- C)  $4\sqrt{3}$
- D)  $12\sqrt{2}$

22

|     |   |   |   |   |
|-----|---|---|---|---|
| $x$ | 0 | 1 | 2 | 3 |
| $y$ | 4 | 4 | 4 | 4 |

The table above represents the equation  $y = 2k$ .  
What is the value of  $k$ ?

- A) 4
- B) 2
- C) 8
- D) 1

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## Math

22 QUESTIONS | 35 MINUTES

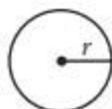
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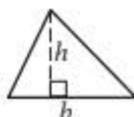


$$A = \pi r^2$$

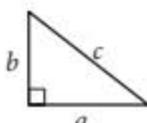
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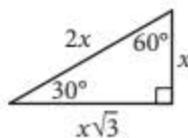
$$A = \ell w$$



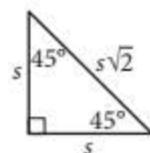
$$A = \frac{1}{2}bh$$



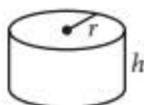
$$c^2 = a^2 + b^2$$



Special Right Triangles



$$V = \ell wh$$



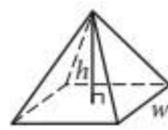
$$V = \pi r^2 h$$



$$V = \frac{4}{3}\pi r^3$$



$$V = \frac{1}{3}\pi r^2 h$$



$$V = \frac{1}{3}\ell wh$$

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1

Which of the following is a solution for the equation below?

$$3x^2 - 19x + 6 = 0$$

- A) -6
- B) 2
- C)  $\frac{1}{3}$
- D)  $-\frac{1}{3}$

2

In the equation of a circle given below, what would be the value of its diameter?

$$x^2 - 8x + y^2 + 10y = 8$$

- A) 7
- B) 14
- C) 16
- D) 49

3

If  $f(x) = -2x - 6$ , what is the value of  $|f(2)|$ ?

4

Which of the following is equivalent to  $\tan(90 - x)^\circ$ ?

- A)  $\frac{\sin x}{\cos x}$
- B)  $\frac{\cos x}{\sin x}$
- C)  $\frac{\cos(90 - x)^\circ}{\sin(90 - x)^\circ}$
- D)  $-\tan x$

5

Alina started a savings account with \$113. She would earn a simple interest of 6.8% on her deposit monthly. The equation below represents the total amount of money  $A(t)$  in her savings account in  $t$  months. What does 7.684 represent in this context?

$$A(t) = 113 + 7.684t$$

- A) The amount of interest earned after  $t$  months
- B) The total amount in the account after  $t$  months
- C) The amount of interest earned every month
- D) The interest earned every year.

6

The given equation is part of a system of equations. If the system has no solution, which of the following could be the equation of the second line in the system?

$$6x - 3y = 2$$

- A)  $2x - 3y = 4$   
 B)  $-2x + y = 4$   
 C)  $-2x + y = \frac{-2}{3}$   
 D)  $3x - \frac{3}{2}y = 1$

7

If  $p(x) = 2x^2 - 6x + 5$ , what is the value of  $p(2)$ ?

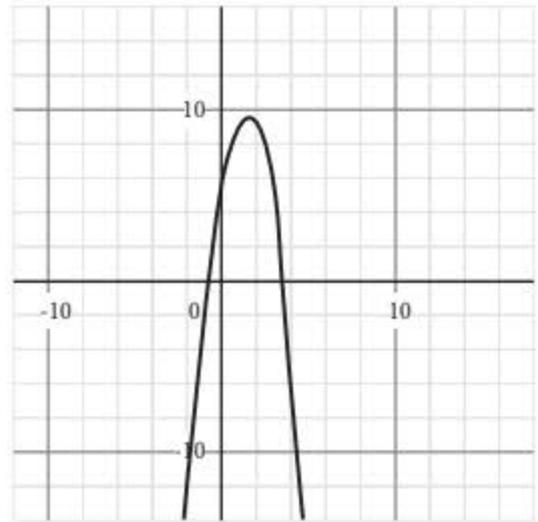
8

Which of the following is the equation of a line that passes through the origin and point  $(6, 5)$ ?

- A)  $5y = 6x$   
 B)  $6y = 5x$   
 C)  $y = 5x + 6$   
 D)  $y = 6x + 5$

9

Which of the following is the equation of the graph below?



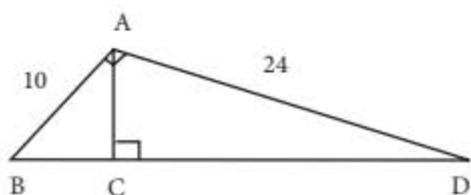
- A)  $y = 2x^2 - 6x + 5$   
 B)  $y = 2x^2 + 6x + 5$   
 C)  $y = -2x^2 - 6x + 5$   
 D)  $y = -2x^2 + 6x + 5$

10

If a quadrilateral has the following interior angles  $x^\circ$ ,  $(x + 40)^\circ$ ,  $(x + 50)^\circ$ ,  $(x - 10)^\circ$ , what is the value of  $x$ ?

11

If triangle ABD is a right triangle, what is the value of  $\sin CAD$ ?



- A)  $\frac{12}{13}$   
 B)  $\frac{12}{5}$   
 C)  $\frac{5}{13}$   
 D)  $\frac{5}{12}$

12

Which of the following expressions is equivalent to  $7wp(2w + 5)$ ?

- A)  $14w^2p + 35$   
 B)  $14w^2p + 35wp$   
 C)  $14w^2 + 35p$   
 D)  $9w^2p + 35pw$

13

The volume of sphere A is 27 times that of sphere B. If sphere B has a radius of  $4cm$ , what is the radius of sphere A?

14

A weather forecast report predicted that there is a 43% chance of rain on Monday. The report also indicated that it is twice as likely to rain on Thursday than on Monday. What is the probability that it won't rain on Thursday?

- A) 0.43  
 B) 0.57  
 C) 0.14  
 D) 0.86

15

What is the least possible integer value of  $x$  for the inequality below?

$$\frac{16^x}{4^x} > 2^6$$

- A) 3  
 B) 4  
 C) 2  
 D) 0

16

Given that  $3(ax - b) + 4(bx - a) = x - 6$ , what is the value of  $a$ ?

17

What is the volume of a cone with a radius of  $12\text{cm}$  and a height 6 more than its radius?

- A)  $2,160\pi$
- B)  $864\pi$
- C)  $1,080\pi$
- D)  $960\pi$

18

What is the slope of the equation of the line below?

$$4x - 3y = 6$$

19

If the circumference of a circle is  $20\pi$ , what is the value of the angle that is subtended by an arc length of  $3\pi$ ?

20

Thirty students are required to pay a total of  $p$  dollars for a field trip. If 28 students paid before the day of the trip, how much was already paid in total?

- A)  $28p$
- B)  $\frac{14}{15}p$
- C)  $30p$
- D)  $\frac{p}{30}$

21

If the equation of a circle with a center  $(-3, 5)$  and a radius of  $6\text{cm}$  is written in the form  $ax^2 + bx + cy^2 + dy + e = 0$ , what is the value of  $e$ ?

- A) 9
- B) 36
- C) -2
- D) 25

22

Which of the choices below is a possible value of  $x$  for the given linear inequality?

$$-3(x + 2) < 2(x - 8)$$

- A) 1
- B) 2
- C) 0
- D) 3

---

**STOP**

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# Answer Key

## Reading and Writing

## Math

### Module 1

### Module 2

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

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

### Module 1

### Module 2

| Questions | Correct | Mark your correct answers |
|-----------|---------|---------------------------|
| 1.        | A       |                           |
| 2.        | C       |                           |
| 3.        | 2       |                           |
| 4.        | D       |                           |
| 5.        | A       |                           |
| 6.        | 13      |                           |
| 7.        | A       |                           |
| 8.        | C       |                           |
| 9.        | C       |                           |
| 10.       | -5      |                           |
| 11.       | C       |                           |
| 12.       | D       |                           |
| 13.       | A       |                           |
| 14.       | 41      |                           |
| 15.       | D       |                           |
| 16.       | A       |                           |
| 17.       | 10      |                           |
| 18.       | B       |                           |
| 19.       | B       |                           |
| 20.       | 4       |                           |
| 21.       | D       |                           |
| 22.       | B       |                           |

| Questions | Correct | Mark your correct answers |
|-----------|---------|---------------------------|
| 1.        | C       |                           |
| 2.        | B       |                           |
| 3.        | 10      |                           |
| 4.        | B       |                           |
| 5.        | C       |                           |
| 6.        | B       |                           |
| 7.        | 1       |                           |
| 8.        | B       |                           |
| 9.        | D       |                           |
| 10.       | 70      |                           |
| 11.       | A       |                           |
| 12.       | B       |                           |
| 13.       | 12      |                           |
| 14.       | C       |                           |
| 15.       | B       |                           |
| 16.       | 3       |                           |
| 17.       | B       |                           |
| 18.       | A       |                           |
| 19.       | 54      |                           |
| 20.       | B       |                           |
| 21.       | C       |                           |
| 22.       | D       |                           |

1. **Level:** Medium | **Skill/Knowledge:** Words in Context

**Key Explanation:** **Choice B** is the best answer. The blank is a verb that shows what the Bank of America did to the first modern credit card. **Choice B** refers to distributing something for use or sale, so aptly shows that the credit cards were first given out to customers in 1958.

**Distractor Explanations:** **Choice A** is incorrect because it refers to sending something away with a purpose, such as sending an order to an army. It does not refer to selling something or making something available to many people. **Choice C** is incorrect because it refers to putting something into someone's care. **Choice D** refers to distributing the parts of a whole, such as allocating funds.

2. **Level:** Easy | **Domain:** CRAFT AND STRUCTURE  
**Skill/Knowledge:** Words in Context

**Key Explanation:** **Choice A** is the best answer because "removing" is a verb that shows what Mr. Dashwood cannot do to the furniture. **Choice A** refers to carrying objects from one place to another, which fits the context of saying that Mr. Dashwood cannot "be of service" or "help" his mother move the furniture to a new house that is too far away.

**Distractor Explanation:** None of the other choices fits the context of explaining that Mr. Dashwood cannot help take the furniture to a faraway place. **Choices B** and **D** refer to disconnecting something, such as removing a part that is fastened in some way. **Choice C** refers to ordering or sending something away. None of these choices contain the idea of taking the

possessions to a new location.

3. **Level:** Hard | **Domain:** CRAFT AND STRUCTURE  
**Skill/Knowledge:** Words in Context

**Key Explanation:** **Choice A** is the best answer. "Peculiar" is used to describe Caravaggio's style, which is elsewhere described as "distinct" or "characteristic" of his work. **Choice A** refers to something unique or one-of-a-kind, which fits the context of art that was very notable and later adopted by a different school of artists.

**Distractor Explanation:** **Choice B** is incorrect because it has a negative connotation that implies that the writer does not like it, whereas the writer refers to the work as "enchanting" or "fascinating," indicating that there is a positive quality to it. **Choice C** is incorrect because it relates to feeling unwell or slightly sick, a very different meaning of "peculiar." **Choice D** is incorrect because it refers to something which is possible to see. Although Caravaggio's use of shadows was possible to see, the author is referring to a different, special quality that Baroque artists later used.

4. **Level:** Hard | **Domain:** CRAFT AND STRUCTURE  
**Skill/Knowledge:** Words in Context

**Key Explanation:** **Choice C** is the best answer. "Endow" refers to formally giving money to someone or something, so fits the context of explaining that much of her "legacy" or "money given to people in a will" went to charities.

**Distractor Explanation:** None of the other choices adequately explain what happened between the legacy and charities. **Choice A** refers

to forcing someone to comply with laws or rules. **Choice B** refers to surrendering or yielding something, but the charities were not surrendered to anything. **Choice D** is incorrect because it refers to giving power or recognition, not money.

5. **Level:** Hard | **Domain:** CRAFT AND STRUCTURE

**Skill/Knowledge:** Text Structure and Purpose

**Key Explanation:** **Choice D** is the best answer. The fact that D'Artagnan notices that people turn around to look stresses that he is very nervous about appearing like an "embarrassed provincial." He realized that they saw through his front and "felt ridiculous." By mentioning the fact that he saw them, it is clear to the reader why his "very good opinion of himself" changed.

**Distractor Explanations:** **Choice A** is incorrect because there is no conflict in the text. **Choice B** is incorrect because a "temporal change" is a shift in time, but the time sequence remains consistent. **Choice C** is incorrect because the reader has no idea what the scene really is; one knows D'Artagnan is walking by a group of people, but there is no clue how many or where they are.

6. **Level:** Medium | **Domain:** CRAFT AND STRUCTURE

**Skill/Knowledge:** Text Structure and Purpose

**Key Explanation:** **Choice B** is the best answer. The passage starts by saying that Levin planned to tell his brother about the marriage, and ends by saying he did not because he was afraid his brother would not view it favorably. The underlined portion gives part of the reason Levin changed his mind: his brother used an "unconsciously patronizing tone" or "spoke as if he looked down on Levin without intending to do

so." Therefore, Levin felt "inferior" or "too low" to discuss an important topic.

**Distractor Explanation:** **Choice A** is incorrect because the topic of the conversation with the professor is not given; the conversation about agriculture came "afterwards" or "later," and was presumably between Levin and his brother rather than the professor. **Choice C** is incorrect because there is no indication that the conversation about agriculture was an "obstacle" or "barrier" that prevented Levin from getting married; the details could have related to anything agricultural. Instead, the conversation was conducted in a tone which made him feel like he should bring up the topic at a different time. **Choice D** is incorrect because there is no indication that Levin and his brother "frequently" or "often" disagreed about agriculture. In fact, they might not have disagreed in this case, either. The brother just talked in a "patronizing" or "belittling" way.

7. **Level:** Easy | **Domain:** CRAFT AND STRUCTURE

**Skill/Knowledge:** Cross-Text Connections

**Key Explanation:** **Choice A** is the best answer because Text 1 describes the "first public tasting of cultured meat" in 2013, and Text 2 explains the "later development" or "thing which occurred afterwards" by saying that the "first sales occurred in December 2020."

**Distractor Explanations:** **Choice B** is incorrect because Text 1 does not actually say how anyone viewed the product, only that it was first tasted on television. **Choice C** is incorrect because only Text 1 says that it was expensive to develop. Text 2 refers to "skepticism" or "concern" about the product, but does not discuss how it was "created" or "made." **Choice D** is incorrect because Text

2 refers to the public's reaction of "skepticism," but Text 1 never says what people other than the creator thought of the product.

8. **Level:** Medium | **Domain:** CRAFT AND STRUCTURE

**Skill/Knowledge:** Cross-Text Connections

**Key Explanation:** **Choice A** is the best answer. Text 1 claims that polar bear populations are not threatened any longer because there was a ban on hunting. However, Text 2 points out that climate change is a severe problem. The author of the Text 2 further distinguishes between changes in different populations, which indicates that while the numbers may be increasing overall, there may be serious losses in genetic diversity if some of the populations die out. Therefore, the author of Text 2 would probably say that Text 1 shows a "limited" or "insufficient" analysis of the complete situation.

**Distractor Explanation:** **Choice B** is incorrect because, while Text 1 does say that total numbers have "rebounded" or "returned to previous levels," the author of Text 2 points out that some populations have not. In addition, the author of Text 1 does not mention the problem of global warming, which Text 2 points out is eliminating sea ice essential to the survival of the polar bears. Therefore, the author of Text 2 would probably not find the text "inspiring" or "uplifting," but rather "incomplete" or "in error." **Choice C** is incorrect because, while the author of Text 2 might say that Text 1 is "erroneous" or "wrong" in claiming that polar bears are not "in imminent danger of extinction" or "threatened," the reason is not correct. The author of Text 2 might say that the total number is correct, but it is more important to look at numbers in different populations. **Choice D** is incorrect because Text 1 does not imply that efforts to conserve polar bears are "only partially

successful." Rather, Text 1 indicates that efforts were successful and now there is little concern at all. The author of Text 2 would be worried about climate change, not about the positive information regarding hunting given in Text 1.

9. **Level:** Easy | **Domain:** INFORMATION AND IDEAS

**Skill/Knowledge:** Central Ideas and Details

**Key Explanation:** **Choice A** is the best answer. The passage says that thundersnow, a "meteorological event" or "weather phenomenon" is rare, then explains what it is and how it is different from a thunderstorm. Therefore, the main purpose is to introduce a reader to the unusual weather event.

**Distractor Explanations:** **Choice B** is incorrect because only one sentence in the passage says that thundersnow is most common over "large bodies of water" and gives examples, but also says that the event occurs elsewhere. There is not enough information to know what kinds of other places are suitable, so **Choice B** is not the main purpose of the passage. **Choice C** is incorrect because "why" or "the reasons for" the effect are not discussed. The passage only says that the formation occurs in the same way that thunderstorms do. **Choice D** is incorrect because a "dilemma" is a problem, but there is no discussion of a problem that needs solved.

10. **Level:** Medium | **Domain:** INFORMATION AND IDEAS

**Skill/Knowledge:** Central Ideas and Details

**Key Explanation:** **Choice D** is the best answer because the passage focuses on how Electra increases her savings from \$25 to buy a plot of land to having enough money after seven years

to build a house for her family. “Thrift” refers to the ability to manage money well, so accurately describes Electra.

**Distractor Explanations:** **Choice A** is incorrect because the text points out that Electra had more money than her husband to begin with, but since she is saving increasing amounts after they got married, he is at least capable of earning money. It is possible he is also saving more on his own, too. **Choice B** is the opposite of the correct answer. The text says that they were romantic, but “practical” refers to making good decisions about everyday life, and the couple save enough for a nice house. **Choice C** is incorrect because there is no indication that Saladin is “taking advantage” or “using” Electra’s money; she is saving the money he earned, so he is contributing to the family finances.

11. **Level:** Hard | **Domain:** INFORMATION AND IDEAS

**Skill/Knowledge:** Command of Evidence (Textual)

**Key Explanation:** **Choice C** is the best answer. The claim is that the author “bewails” or “expresses great regret” about a friend in the poem. **Choice C** says “thou art gone,” meaning “you are no longer here.” The following line, “and never must return” gives more of a clue to what happened: if the friend cannot return, he is probably dead. In other words, **Choice C** shows that there was a “heavy” or “horrible” change in that the friend died and the author is very sad.

**Distractor Explanation:** **Choice A** is incorrect because it only refers to picking plants, not to any reason for doing so. **Choice B** is incorrect because it only reinforces that they are friends who “nurst upon the self-same hill” or “grew up together,” and

“fed the same flock,” meaning that they worked together. The friendship is established but there is no indication of mourning or sorrow. **Choice D** refers to fame, not to friendship or sorrow, so is incorrect.

12. **Level:** Easy | **Domain:** INFORMATION AND IDEAS

**Skill/Knowledge:** Command of Evidence (Textual)

**Key Explanation:** **Choice B** is the best answer. “Selective disobedience” is defined as a situation where the dog refuses to do something that the owner orders but which might hurt the dog or the owner. **Choice B** gives just such a situation: if the dog leads the owner onto the street, then the dog, the owner, or both could get hit by a truck. The dog makes a decision to wait rather than allow an injury to happen.

**Distractor Explanations:** **Choice A** is incorrect because there is no indication that an injury would occur if the dog follows the order to watch the cows. If anything, the dog has decided to do something dangerous, as the cows could get lost or cause damage to property. **Choice C** is incorrect because it shows a situation where the dog follows orders, but “selective disobedience” refers to deciding not to follow an order. **Choice D** is incorrect because it is unclear whether the dog is following orders or not. Also, there is no indication that the dog or the person will get harmed if the dog alerts the owner about the ringing phone.

13. **Level:** Medium | **Domain:** INFORMATION AND IDEAS

**Skill/Knowledge:** Command of Evidence (Quantitative)

**Key Explanation:** Choice D is the best answer because the table only includes data for the year 2018. The text warns that “federal, state, and local government budgets may affect the employment of planners in government, because development projects are contingent on available funds.”

In other words, employment may increase or decrease if available “funds” or “money” changes. “Budgets” are “spending plans,” so if the federal government revises or changes its plans due to “fewer tax dollars,” the amount of money for employing planners may be lower. Therefore, there is a “potential” or “chance” that there will be fewer planners in the future than listed in the table.

**Distractor Explanation:** Choice A is incorrect because neither the table nor the text explains where federal planners work; it is possible that they work in large cities. Therefore, there is not enough evidence to say that the percentage is low because of “need” or “demand” in one area or another. Choice B is incorrect because, while no exact numbers are given, the table does show the percentages of the total number of planners. Therefore, it is possible to determine which sectors hire more planners than others. The actual number is “reflected” or “indicated” as a comparison. Choice C is incorrect because the text does not say that federal government positions are stable. On the contrary, the text says that employment in government positions is variable depending upon budgets, so if the budget changes in any of the levels of government, the percentage of people employed by each sector may also change.

14. **Level:** Medium | **Domain:** INFORMATION AND IDEAS

**Skill/Knowledge:** Inferences

**Key Explanation:** Since the group did not want to say “farewell” and everyone went out to see the narrator off, it is logical to assume that the narrator is not leaving for a brief trip. Since Elizabeth asked for the narrator to write, there will be time to send letters.

**Distractor Explanations:** Choice A is incorrect because the gender is not given; it is possible that the narrator is a man. Choice B is incorrect because the narrator could have traveled before. Choice C is incorrect because, while the narrator didn’t want to leave the others, it is possible that the narrator was looking forward to the end of the journey and what would happen upon arrival.

15. **Level:** Medium | **Domain:** INFORMATION AND IDEAS

**Skill/Knowledge:** Inferences

**Key Explanation:** Choice D is the best answer because Clark claims, “extinction of species should cause us greater concern than if we believed that biodiversity was maintained in the past by continual replenishment of random extinction by generation of new species.” In other words, he feels that if one species goes extinct, it would show that the biodiversity is not being maintained as it should be; the stabilizing forces would no longer be functioning properly. That could indicate a “collapse” or “failure” of the entire system.

**Distractor Explanation:** Choice A is incorrect because Clark implies that because of stabilization, ecosystems remain in balance, but if one part of the balance is disrupted, the entire system may collapse. Therefore, a total collapse is more likely than if the system is random. Choice B is incorrect because it refers to the situation in the neutral theory, not the biodiversity stabilization theory. Choice C is incorrect because the

stabilization theory proposes that the number of species remains about the same. It is implied that the rate of addition and extinction would therefore be about the same.

16. **Level:** Medium | **Domain:** STANDARD ENGLISH CONVENTIONS

**Skill/Knowledge:** Form, Structure, and Sense

**Key Explanation:** **Choice D** is the best answer because it is a passive past perfect form. That form shows that something else did the act of destroying to the subject; in this case, the arsonist destroyed the pavilion.

**Distractor Explanation:** **Choice A** is incorrect because it is an active form, but the pavilion did not do the act of destroying, the arsonist did. **Choice B** is incorrect because “despite” should not be followed by a clause with a noun and verb. **Choice C** is incorrect because “despite” should not be followed by an infinitive verb.

17. **Level:** Easy | **Domain:** STANDARD ENGLISH CONVENTIONS

**Skill/Knowledge:** Form, Structure, and Sense

**Key Explanation:** **Choice C** is the best answer. The underlined portion is a word that modifies “different,” which is an adjective. **Choice C** is an adverb, so correctly can be used to describe how different the habitats are.

**Distractor Explanation:** All of the other choices are incorrect because they are parts of speech which cannot be used to modify an adjective. **Choice A** is another adjective. **Choices B** and **D** are nouns that mean, respectively, “the furthest point” and “a person who had radical views.”

18. **Level:** Medium | **Domain:** STANDARD ENGLISH CONVENTIONS

**Skill/Knowledge:** Form, Structure, and Sense

**Key Explanation:** **Choice D** is the best answer. “First performed in England in 1984” is a modifier that describes *Starlight Express*, so it needs to be followed by the noun it modifies. **Choice D** correctly puts the parts of the sentence in order with *Starlight Express* at the start of the main clause.

**Distractor Explanation:** All of the other choices can be eliminated because “First performed in England in 1984” illogically refers to a person rather than the musical. In **Choice A**, the modifier refers to both Stilgoe and Webber. In **Choice B**, it refers to Stilgoe, and in **Choice C** it refers to Webber.

19. **Level:** Medium | **Domain:** STANDARD ENGLISH CONVENTIONS

**Skill/Knowledge:** Form, Structure, and Sense

**Key Explanation:** **Choice B** is the best answer. “People” is plural, and since it ends with an “e,” there needs to be an apostrophe and “s” to show that the opinions belong to the people.

**Distractor Explanation:** **Choices A** and **D** are incorrect because “peoples” is not the correct plural apostrophe, as “people” already refers to more than one person. **Choices C** and **D** are also incorrect because “opinions” does not possess anything, so does not need an apostrophe of possession.

20. **Level:** Medium | **Domain:** STANDARD ENGLISH CONVENTIONS

**Skill/Knowledge:** Boundaries

**Key Explanation:** Choice D is the best answer. “Invented in...Sousa” is an added piece of information to the main idea that “the sousaphone is a brass instrument...” Such information could be included with commas at each end, in parentheses, or with dashes at each end, but must use the same punctuation at both ends. Since “invented” is preceded by a dash, “Sousa” needs to be followed by one.

**Distractor Explanation:** Choice A is incorrect because a single dash in a sentence needs to follow a complete clause, but “The sousaphone” is just a noun. Choice B is incorrect because “is” is placed in the aside and away from the main clause, leaving the main clause without a verb. That problem can be more easily seen by writing the sentence without the words between the dashes: “the sousaphone is a brass instrument...” Choice C is incorrect because it uses a comma rather than a dash, so the punctuation at the start and end of the aside are not consistent.

21. **Level:** Easy | **Domain:** STANDARD ENGLISH CONVENTIONS  
**Skill/Knowledge:** Boundaries

**Key Explanation:** Choice D is the best answer. “Tenochtitlan, Texcoco, and Tlacopan” are added information to describe the previous noun, “three separate city-states.” They are not essential to understand the meaning of the noun, so need to be divided from the noun they refer to with a comma. There should also be a comma after “Tenochtitlan” and “Texcoco” because they are three items in a list joined by “and.” Such lists need to have a comma after each item.

**Distractor Explanation:** In Choices A and B, a colon is not incorrect after “city-states” because the previous sentence can stand on its own and

the following information adds detail to that sentence. However, Choice A is incorrect because “and” in a list is not followed by a comma. Choice B is incorrect because single words need to be separated by commas in a list, not by semicolons (semicolons are only used when the items in the list are multiple words with commas). Choice C is incorrect because a comma is necessary to divide “city-states” from the names of the city-states; a noun cannot be followed directly by another noun without punctuation showing how they relate to each other.

22. **Level:** Easy | **Domain:** STANDARD ENGLISH CONVENTIONS  
**Skill/Knowledge:** Boundaries

**Key Explanation:** Choice B is the best answer because a comma needs to divide non-essential information from a noun that it describes. In this case, there is only one first line of the poem, so the actual words in the line are helpful but not necessary to understand the noun.

**Distractor Explanation:** Choice A is incorrect because there should be a comma after “line” because the words from the poem are not necessary to understand the sentence. Choices C and D are incorrect because they create a comma splice between two clauses. Both the parts before and after the comma can stand on their own as sentences.

23. **Level:** Easy | **Domain:** EXPRESSION OF IDEAS  
**Skill/Knowledge:** Transitions

**Key Explanation:** Choice B is the best answer because it is used to show an exception or change the tone of a passage. The preceding sentence says nuts are related to a longer life, but the following says that it is unclear whether the nuts actually

cause the longer life. **Choice B** therefore effectively shows that there is doubt related to the first claim.

**Distractor Explanation:** None of the other choices accurately show that the tone changes between sentences. **Choice A** is used to show the result of the first claim, not to show an exception. **Choice C** is used to emphasize the first point with supporting information. **Choice D** is used to highlight a common idea between two concepts that are related.

24. **Level:** Medium | **Domain:** EXPRESSION OF IDEAS

**Skill/Knowledge:** Transitions

**Key Explanation:** **Choice D** is the best answer because it is used to show that something happened despite possible ambiguity over previous claims. The previous sentence refers to a range of hypotheses about why King Tut died, which demonstrates ambiguity about the death. The second sentence shows a situation that is common to each of the possible scenarios; the death was fast.

**Distractor Explanation:** **Choices A** and **B** are incorrect because they are used to introduce the logical conclusion of a previous claim. However, the fact that the death was fast is not necessarily logical given the options expressed; for example, he could have lived a long time after an injury or illness. **Choice C** is incorrect because it is used to give another option or possibility. However, the following sentence discusses something that is true in all of the cases, not something which is separate from one of the theories. For example, being murdered is a form of unexpected death.

25. **Level:** Easy | **Domain:** EXPRESSION OF IDEAS  
**Skill/Knowledge:** Transitions

**Key Explanation:** **Choice D** is the best answer because it is used to introduce the result of a series of events. In this context, **Choice D** aptly introduces the result of intimidating the natives because Columbus was worried that the natives might harm his crew or stop providing food. If they were intimidated, they would continue giving necessary supplies without rebelling.

**Distractor Explanation:** **Choice A** is incorrect because it is used to show that something happens despite something else, but in this case, the second is a direct result of the first. **Choice B** is used to paraphrase the preceding idea, so does not fit the context of continuing a story. **Choice C** is used to identify similarities in a comparison rather than show how one event was stopped by another.

26. **Level:** Medium | **Domain:** EXPRESSION OF IDEAS

**Skill/Knowledge:** Rhetorical Synthesis

**Key Explanation:** **Choice B** is the best answer because it clearly meets the student's goal of "differentiating" or "showing the contrasts" between Keith's theaters and others. **Choice B** highlights two main differences from the notes. One is that the performances were "polite" because they did not have vulgarity, swear words, or audiences that heckled. The other is that the theaters were elaborate by comparison to "other theaters in that period."

**Distractor Explanation:** **Choice A** is incorrect because it only says Keith owned more theaters; there is nothing which shows how those theaters are different from other people's. Keith's theaters were elaborate, but **Choice A** does not show

that other theaters were simple. **Choice C** is incorrect because there is no mention of the type of performances that other people's theaters ran; in addition, the fact that Albee took over does not offer a contrast for what happened in other situations. **Choice D** is incorrect because it only says what Keith preferred and did; there is no contrast to show how his decisions led to differences from other theaters.

27. **Level:** Hard | **Domain:** EXPRESSION OF IDEAS  
**Skill/Knowledge:** Rhetorical Synthesis

**Key Explanation:** **Choice B** is the best answer because it explains what the blood moon is, including when it occurs and how it forms. **Choice B** therefore best accomplishes the goal of educating the audience about a blood moon.

**Distractor Explanation:** **Choice A** can be eliminated because the audience already knows about a lunar eclipse, so does not need more information about how one occurs. **Choice A** mentions a blood moon, but does not help the reader understand what it is or why the moon turns red. **Choice C** is incorrect because according to points 3 and 4, the entire total lunar eclipse is not called a blood moon; a blood moon is only a stage or phase of the process. **Choice D** is incorrect because it erroneously indicates that red light from the Sun shines through the Earth, but instead, the final point shows that the Moon is colored by light that shines around the Earth.

1. **Level:** Medium | **Domain:** CRAFT AND STRUCTURE

**Skill/Knowledge:** Words in Context

**Key Explanation:** **Choice D** is the best answer because the blank portion shows what “Donovan” did to “childcare.” **Choice D** refers to a great change or improvement, so fits the context of saying that disposable diapers completely changed the way children could be raised.

**Distractor Explanations:** None of the other choices accurately show what “Donovan” did to “childcare.” **Choice A** refers to putting something back together, but childcare has not been damaged or fallen apart from a better state. **Choice B** refers to changing the structure of an institution or rearranging objects in a place, and **Choice C** refers to changing the name or identification of something.

2. **Level:** Medium | **Domain:** CRAFT AND STRUCTURE

**Skill/Knowledge:** Words in Context

**Key Explanation:** **Choice D** is the best answer because “application” refers to the starting point of the salt stress. **Choice D** refers to the carrying out of a course of action, so aptly shows that the number of days from the action of creating stress until the appearance of the first flowers was recorded.

**Distractor Explanations:** None of the other choices fits the context of indicating when the salt process began. **Choice A** refers to “meaning” or “importance. **Choice B** refers to putting in hard effort over a long period. **Choice C** refers to asking for something.

3. **Level:** Hard | **Domain:** CRAFT AND STRUCTURE

**Skill/Knowledge:** Words in Context

**Key Explanation:** **Choice B** is the best answer. “Adroitness” means “skill” or “talent,” so shows that the composition “exemplifies” or “stands as a model of” the artist’s ability to manipulate or control color.

**Distractor Explanations:** None of the other choices adequately explain what the manipulation of subtle colors refers to. **Choice A** refers to the state of being easily harmed by something, but Whistler was not harmed by the colors. **Choice C** refers to an agreement to do something, such as meet a person. **Choice D** refers to something that distracts from a serious activity.

4. **Level:** Medium | **Domain:** CRAFT AND STRUCTURE

**Skill/Knowledge:** Text Structure and Purpose

**Key Explanation:** **Choice A** is the best answer because “casting doubt” refers to showing that something may not be true; “veracity” is “truth.” The underlined word also has the same meaning: it shows that something is said but that there is doubt about whether the claim is true or not. The claim is that Knight created the Lassie character, but the following sentence shows there is doubt: Gaskell wrote about such a character almost a century earlier. In other words, the underlined portion indicates that the author feels that maybe Gaskell was the creator and not Knight, as others said.

**Distractor Explanations:** **Choice B** is incorrect because the underlined portion does not “question” or “cast doubt” on the idea that the stories have a lot in common; instead, the underlined portion emphasizes that they are similar by hinting that maybe Knight copied

the character. **Choice C** is incorrect because the underlined portion does not modify or cast doubt upon “fictional,” it modifies “first introduced.”

**Choice D** is incorrect because there is no indication that Gaskell’s story was popular or widely read at all.

5. **Level:** Medium | **Domain:** CRAFT AND STRUCTURE

**Skill/Knowledge:** Text Structure and Purpose

**Key Explanation:** **Choice B** is the best answer because the example is that Lee is a sensitive director who shows “nuances” or “subtleties” about Black characters. The following portion is a “contrast” or “difference” because it shows how other people stereotyped black actors to specific roles or even painted White people to look like Black ones.

**Distractor Explanations:** **Choice A** is incorrect because there is no mention of a stereotype in the underlined portion; the rest of the text points out that Blacks were reduced to stereotypical roles. **Choice C** is incorrect because there is no evidence that Lee “pioneered” or “started” a change; the text only says that his work is different from that of directors in the past. **Choice D** is incorrect because the problem of Black stereotypes is not mentioned in the underlined portion, so the underlined portion does not show that it took time to “resolve” or “fix” it.

6. **Level:** Easy | **Domain:** CRAFT AND STRUCTURE

**Skill/Knowledge:** Text Structure and Purpose

**Key Explanation:** **Choice B** is the best answer. “Every cloud has a silver lining” is an idiom which means that everything which at first looks bad actually has something good about it. In this case, the material that Subramanian made was not magnetic and could not be used for the purpose

he wanted, but he saw the possibility that he could “market” or “sell” it and earn money because of its other properties.

**Distractor Explanation:** **Choice A** is incorrect because the idiom is not used literally, but figuratively. A “pigment” is a coloring agent like a powder, not a cloud. **Choice C** is incorrect because there is no indication that the pigment could make other colors, only that it was useful for making blue because it had properties most other blues did not. **Choice D** is incorrect because “market the new pigment” shows that Subramanian is taking advantage of or selling the color, not the quality of magnetism. There is no sign that adding something else will make it magnetic after all.

7. **Level:** Medium | **Domain:** CRAFT AND STRUCTURE

**Skill/Knowledge:** Cross-Text Connections

**Key Explanation:** **Choice B** is the best answer because Stearns says that slavery is only possible because laws governing slavery exist. The fact that the slave is owned by the state is one piece of legislation, so it supports the claim that slavery continues due to legislation rather than just the wishes of the slave and owner.

**Distractor Explanation:** **Choice A** is incorrect because Stearns says that the law is the only thing to be considered. Therefore, if the law says that emancipated slaves are state property, it doesn’t matter if the former slave has any paperwork showing otherwise. **Choice C** is incorrect because Stearns says that the U.S. Constitution supports laws of the states, but does not support slavery *per se*. **Choice D** is incorrect because Stearns says that the slaves are subjected to the laws of their masters. In the scenario given, the master would

be the state, so running away would not protect the slave from the laws of that state.

8. **Level:** Easy | **Domain:** INFORMATION AND IDEAS

**Skill/Knowledge:** Central Ideas and Details

**Key Explanation:** **Choice D** is the best answer because the passage states that “They are extremely adaptable to a wide variety of habitats” and “are now flourishing in different areas.” In other words, coywolves are able to “adapt” or “change” enough to live in many different “habitats” or “natural surroundings.” Hence, they are in a range of “environmental conditions.”

**Distractor Explanations:** **Choice A** is incorrect because the text offers no comparison of which place has the most coywolves; it only says that they live in many habitats in Canada and other places. **Choice B** is incorrect because there is no indication of how closely related coywolves are to any species; it could be that they have one wolf parent and one coyote parent. **Choice C** is incorrect because the passage only says that coywolves “first appeared” in Canada in the 20th century. It is unclear whether anyone bred them or whether they hybridized naturally in the wild.

9. **Level:** Easy | **Domain:** INFORMATION AND IDEAS

**Skill/Knowledge:** Central Ideas and Details

**Key Explanation:** **Choice B** is the best answer because the final sentence says that Nabongo “has written a book about her adventures.” Since “her adventures” refers to traveling to all the countries in the world, she is an “author” or “writer” of such a book.

**Distractor Explanations:** **Choice A** is incorrect

because the text does not say which country Nabongo was born in; the fact that she is Ugandan–American could mean she was born in the U.S. to Ugandan parents. **Choice C** is incorrect because there is no indication of which order Nabongo visited the locations. **Choice D** is incorrect because the text does not give Nabongo’s opinion just of the Seychelles, only of her travels in general.

10. **Level:** Easy | **Domain:** INFORMATION AND IDEAS

**Skill/Knowledge:** Central Ideas and Details

**Key Explanation:** **Choice B** is the best answer. The first sentence explains the idea of The Fun Theory and the second sentence explains how the company proposed to test the theory. The final sentence gives the results: a large percentage of people changed their behaviors due to the fun factor which was introduced.

**Distractor Explanation:** **Choice A** is incorrect because the passage says that the experiment was designed to test a theory used in an advertising campaign, but does not explain the results of the campaign. It is possible that no additional cars were sold as a result of it. **Choice C** is incorrect because the passage does not say that more people took the stairs than the escalator, only that the use of stairs increased. It is possible that the use of the escalator was still higher than the stairs. **Choice D** is incorrect because there is no discussion that other places should adopt the same type of piano stairs; the passage only says that the stairs were effective in changing behavior in this experiment.

11. **Level:** Hard | **Domain:** INFORMATION AND IDEAS

**Skill/Knowledge:** Command of Evidence (Textual)

**Key Explanation:** Choice C is the best answer. The claim is that the park is “considered a world treasure for more than its beauty” or “valuable for things other than the way it looks.” Choice C gives an important reason that people might want to conserve it: the climate is “unique” or “one of a kind” that is high in biodiversity, as illustrated by the huge number of plants in the area.

**Distractor Explanation:** Choice A is incorrect because it only says that the site is preserved; it does not give a reason why. Choice B is incorrect because there is no reason that a country boundary is a world heritage site of great value; this choice could be acceptable if there were reasons showing why the basaltic line is special, but not as it stands. Choice D is incorrect because it gives a reason that the park might have lost value. If the park has also been damaged, then the conservation value is decreased.

12. **Level:** Medium | **Domain:** INFORMATION AND IDEAS

**Skill/Knowledge:** Command of Evidence (Quantitative)

**Key Explanation:** Choice A is the best answer because the statement describes the “difference in the iron uptake increase.” Therefore, the correct answer is derived by subtracting the smaller column from the larger. The smaller column is the control mouse, which has a value of about 2.7. The larger represents the mouse with no HEPHL1 genes, which has a value of about 3.8. The difference is  $3.8 - 2.7 = 1.1$ . Even if the values are changed by a few decimal points, Choice A is the closest approximate.

**Distractor Explanation:** None of the other choices shows the “difference in the iron uptake increase.” Choice A would represent a difference

larger than 2 of the lines on the y-axis, but there is only one line (the one for 3 nmoles) between the two bars. Choice C refers to the total increase for the control mouse, not the difference between the control mouse and the mouse with no HEPHL1. Choice D refers to the total increase of the mouse with no HEPHL1.

13. **Level:** Medium | **Domain:** INFORMATION AND IDEAS

**Skill/Knowledge:** Command of Evidence (Quantitative)

**Key Explanation:** Choice B is the best answer because the graph shows the percentage of increase from the previous year, 2015. The data for Sierra Leone, in the far left-hand column, is just over 120%, but the data for Togo, the second column from the right, says that there was only a growth of just over 20%. The passage points out that quality and accessibility affect whether tourists are attracted to a site or not. Therefore, it is reasonable to assume that the reason for the great increase is that there was a change in infrastructure that made it easier for tourists to visit.

**Distractor Explanation:** Choice A is incorrect because the graph compares a percentage increase in tourism, not a percentage of the total tourists. It is unknown how many people went to any given place. Choice C is also incorrect because the graph says that Burundi had an increase in visitors of about 40%, which means that it had 40% more than the previous year, not that it had 40% more than other places. Choice D is also incorrect because, while there was a greater increase in the number of visitors in Eritrea than in Madagascar, it is unknown what the original number was. It is possible that Madagascar started with a much greater number of tourists in previous years.

14. **Level:** Medium | **Domain:** INFORMATION AND IDEAS

**Skill/Knowledge:** Inferences

**Key Explanation:** **Choice D** is the best answer because the text refers to trouble that was “not alone for himself, but for every tide–water dog.” Therefore, Buck probably considers himself to be a “tide–water dog.” It is clear he is strong, because the text calls these dogs “strong of muscle and with warm, long hair” and ends by saying that the men wanted dogs that were “heavy dogs, with strong muscles by which to toil, and furry coats to protect them from the frost.”

**Distractor Explanations:** **Choice A** is not supported by the passage because there is reference to steamships as being currently in the news, but Buck does not know the news. Therefore, he has yet to know about going to the north on a ship. **Choice B** is incorrect because finding “yellow metal”—presumably gold in Alaska—is something that is in the news that Buck does not know about. **Choice C** is incorrect because the text appears to be written from a dog’s point of view, as Buck considers himself part of “every tide–water dog.”

15. **Level:** Medium | **Domain:** STANDARD ENGLISH CONVENTIONS

**Skill/Knowledge:** Form, Structure, and Sense

**Key Explanation:** **Choice B** is the best answer because it is an adjective, so can correctly be used after the “to be” verb “are” to describe the noun “citizens.”

**Distractor Explanation:** **Choice A** is a plural noun that refers to circumstances or rules, which does not describe people well. **Choice C** is an adverb, so cannot be used to describe the noun “citizens.” **Choice D** is incorrect because it refers to a substance that makes something softer—for example, a fabric softener.

16. **Level:** Easy | **Domain:** STANDARD ENGLISH CONVENTIONS

**Skill/Knowledge:** Form, Structure, and Sense

**Key Explanation:** **Choice A** is the best answer. The underlined portion is one item in a list joined by “and,” and such lists need to have the same grammatical structure in each item. The first two items are infinitive verbs that follow “to” and show the purpose of the dam: “control” and “increase.” **Choice A** maintains the same structure with the infinitive “generate.”

**Distractor Explanation:** All of the other choices are incorrect because they are not parallel with the other items in the list joined by “and.” **Choice B** includes the noun “it.” **Choice C** changes the order of the words into a clause, and **Choice D** repeats “to,” which is not repeated with “increase water storage.”

17. **Level:** Easy | **Domain:** STANDARD ENGLISH CONVENTIONS

**Skill/Knowledge:** Form, Structure, and Sense

**Key Explanation:** **Choice B** is the best answer. The underlined portion is a verb that needs to agree with the subject, which is the plural word “members.”

**Distractor Explanation:** **Choices A** and **D** are incorrect because they are singular verbs. Though the preceding word, “the society” is singular, the subject is actually plural, “members of the society.” **Choice C** is incorrect because the underlined portion is part of the main clause; “though” subordinates the first half of the sentence. Therefore, an active verb is necessary to make a complete clause, but “dedicating” is a gerund.

18. **Level:** Easy | **Domain:** STANDARD ENGLISH CONVENTIONS

**Skill/Knowledge:** Form, Structure, and Sense

**Key Explanation:** Choice A is the best answer. The underlined portion is part of a list of adjectives joined by “and.” Choice A is parallel with the other adjectives, “courageous” and “rebellious.”

**Distractor Explanation:** All of the other choices can be eliminated because they do not create a parallel list with the adjectives preceding “and.” Choice B is a complete clause. Choices C and D contain verbs.

19. **Level:** Easy | **Domain:** STANDARD ENGLISH CONVENTIONS

**Skill/Knowledge:** Boundaries

**Key Explanation:** Choice A is the best answer because parenthetical information should be considered part of the word it refers to in the sentence and the punctuation should follow the regular punctuation of that part of speech. In this case, the facts in the parentheses describe the subject “shichimi”, so should be considered part of the subject. No commas are needed between the subject and the following verb “is.”

**Distractor Explanation:** All of the other choices are incorrect because they include unnecessary commas. In B and D, the commas separate the noun from the parenthetical information that describe it. In C and D, the commas divide the subject and its verb.

20. **Level:** Easy | **Domain:** STANDARD ENGLISH CONVENTIONS

**Skill/Knowledge:** Boundaries

**Key Explanation:** Choice A is the best answer. “Like stegosaurus and tyrannosaurs” is used to explain what is meant by “familiar species,” so does not have to be separated from the sentence with any punctuation.

**Distractor Explanation:** Choice B is incorrect because “were” is the verb that goes with “familiar species.” If there is only one comma, then “like... of time” becomes a modifier of “species” and there is no verb in the main clause. Choice C is incorrect because “like stegosaurus and tyrannosaurs” could be separated from “species” and the main sentence with commas at both ends, but in that case, there should be no comma after “stegosaurus.” Two nouns joined by “and” should not be separated with punctuation. Choice D is incorrect because a colon needs to follow a complete sentence, but the preceding portion has no verb to go with “species.”

21. **Level:** Easy | **Domain:** STANDARD ENGLISH CONVENTIONS

**Skill/Knowledge:** Boundaries

**Key Explanation:** Choice C is the best answer. The portions before and after the underlined section are both able to stand on their own as sentences, so can be joined with a period or semicolon.

**Distractor Explanation:** Choice A is incorrect because it creates a run-on. Choice B is incorrect because it creates a comma splice. Choice D is incorrect because “and” turns the following portion into a dependent clause that cannot stand on its own as a sentence.

22. **Level:** Medium | **Domain:** STANDARD ENGLISH CONVENTIONS

**Skill/Knowledge:** Boundaries

**Key Explanation:** Choice A is the best answer. “What is little known is that as the plans evolved over the sixteen years of construction” is a modifier separate from the main idea, “a ramp was eliminated.” Additional information needs to be divided from the main clause with a comma, as indicated by the comma after “construction.” A comma should also follow “smaller” because it is part of a series of adjectives modifying the verb “ramp.”

**Distractor Explanation:** None of the other choices correctly divides the sentence. Choices B, C, and D do not have the comma after “construction” that is necessary to identify where the modifier ends and the main clause starts. Choice B includes an unnecessary comma after “ramp,” separating that noun from its verb, “was eliminated.” The comma after “steeper” in Choice C is possible if “much steeper” is used to add description to the word “smaller,” but there is still a comma lacking after “construction.” Choice D is missing all punctuation.

23. **Level:** Medium | **Domain:** EXPRESSION OF IDEAS

**Skill/Knowledge:** Transitions

**Key Explanation:** Choice C is the best answer because it is used to give a detail related to a previous claim. In the context, the general idea of rigorous training is expanded upon with an example of one form of such rigorous training: the dog needs to learn to alert the owner in a special circumstance.

**Distractor Explanation:** None of the other choices establish the relationship that the second sentence gives an example that illustrates the first sentence. Choice A is used to show that

something happened despite the previous claim.

Choice B is used to show the result of the previous claim. Choice D is used to point out a similarity between two different examples.

24. **Level:** Easy | **Domain:** EXPRESSION OF IDEAS  
**Skill/Knowledge:** Transitions

**Key Explanation:** Choice B is the best answer because it is used to show that the following thing comes chronologically after the previous discussion. It fits the context of showing that Gandhi used civil disobedience in the 1920s and King used it in the 1960s.

**Distractor Explanation:** Choice A is incorrect because it is used to introduce the results of an argument, but the fact that King used civil disobedience does not necessarily follow from the points that Thoreau wrote about it and Gandhi practiced it. Choice C is incorrect because it is used to give an example. While the following portion is an example of civil disobedience, it is not an example of the previous sentence, Gandhi’s use of the technique. Therefore, the transition is misplaced at this point. Choice D shows that something happens despite something else. However, King’s use of civil disobedience did not necessarily happen because Gandhi used it; King might have drawn some inspiration from the previous event.

25. **Level:** Medium | **Domain:** EXPRESSION OF IDEAS

**Skill/Knowledge:** Transitions

**Key Explanation:** Choice A is the best answer because it is used to offer a paraphrase or different wording of a previous idea. In this case, it offers a simple explanation “the shell creates a rash” to

clarify the earlier claim that the shells “trigger contact dermatitis” because of oils that are “caustic” or “cause a burning sensation.”

**Distractor Explanation:** **Choice B** is incorrect because it is used to show something similar between a comparison of two items that have common elements but that are not the same. It is not used to explain the same idea in different words. **Choices C** and **D** are incorrect because they are used to introduce the opposite possibility, but the context gives different words for the same thing.

26. **Level:** Easy | **Domain:** EXPRESSION OF IDEAS  
**Skill/Knowledge:** Rhetorical Synthesis

**Key Explanation:** **Choice D** is the best answer because it gives a concise definition of “heat islands” for an audience that does not know what they are. **Choice D** then achieves the student’s goal of offering solutions by summarizing the fourth and fifth bullet points.

**Distractor Explanation:** **Choice A** is incorrect because it mistakenly offers air conditioners as a solution for heat islands, but the notes only say that air conditioners contribute to the problem of global warming. **Choice B** is incorrect because it only explains what heat islands are; it does not offer any solutions as per the student’s goal. **Choice C** is incorrect because an audience that does not know what a heat island is will not know the meaning after reading the statement. It does not include the crucial definition that they are hotter urban areas. Though **Choice C** does offer one way to solve the problem, the reader does not know why it helps.

27. **Level:** Hard | **Domain:** EXPRESSION OF IDEAS  
**Skill/Knowledge:** Rhetorical Synthesis

**Key Explanation:** **Choice A** is the best answer because it is the most convincing argument for a farming community: it shows how the deer can be protected, yet it also shows the people that the student is trying to convince that they will not be harmed in the process. The farmers can “do their jobs” rather than lose land or work because of the new plan.

**Distractor Explanation:** All of the other choices are incorrect because they show how the plan benefits deer, but they do not address the potential concerns of a farming community about such problems as losing part of their property to the corridor or how to continue farming if there are more deer habitats in the area. Therefore, they are not as convincing an argument for the student to use in trying to get the people to agree to a wildlife corridor.



1. **Level:** Easy | **Domain:** ADVANCED MATH  
**Skill/Knowledge:** Nonlinear functions | **Testing point:** Writing exponential function equation from data

**Key Explanation:** Choice A is correct. The initial value of the land is \$47,890, which increases by 2% every year. This suggests that the function is exponential growth. The exponential growth formula is  $f(x) = a(1 + r)^x$  where  $a$  is the initial value,  $r$  is the growth rate and  $x$  is the time. In this situation,  $a = 47,890$ ,  $r = 0.02$ , and  $x = t$ . Substituting these values to the formula yields  $f(x) = 47,890(1.02)^t$ . Making A the correct option.

**Distractor Explanations:** Choices B and D are incorrect. These options are linear functions, however, the model equation in the question is exponential. Choice C is incorrect. This is a decreasing exponential function since the factor 0.98 is less than 1.

2. **Level:** Medium | **Domain:** ALGEBRA  
**Skill/Knowledge:** Linear equations in one variable  
**Testing point:** Matching coefficients

**Key Explanation:** Choice C is correct. Grouping the left side of the equation yields  $(ax + bx) + (a - b) = 5x - 2$ . Factoring out  $x$  from the first group yields  $x(a + b) + (a - b) = 5x - 2$ . Matching coefficients and constants on both sides of the equation yields  $(a + b) = 5$  and  $(a - b) = -2$ . Factoring the given expression  $(a^2 - b^2)$  yields  $a^2 - b^2 = (a + b)(a - b)$ . Substituting the values of  $(a + b)$  and  $(a - b)$  yields  $a^2 - b^2 = (5)(-2) = -10$ .

**Distractor Explanations:** Choice A is incorrect. This is the value of  $(a + b) + (a - b)$ .  
 Choice B is incorrect. This is the value of  $a + b$ .  
 Choice D is incorrect. This is the value of  $a - b$ .

3. **Level:** Medium | **Domain:** ADVANCED MATH  
**Skill/Knowledge:** Nonlinear functions  
**Testing point:** Solving for a quadratic equation using the quadratic formula

**Key Explanation:** To solve for this quadratic equation, use the quadratic formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a},$$

where  $a = 3$ ,  $b = -6$  and  $c = -21$ .

Substituting the given values yields

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(3)(-21)}}{2(3)} \text{ or } x = \frac{6 \pm \sqrt{288}}{6}.$$

Simplifying the equation yields  $x = 1 \pm \frac{12\sqrt{2}}{6}$  or

$$x = 1 \pm 2\sqrt{2}.$$

Matching the two expressions yields

$$1 \pm 2\sqrt{2} = 1 + 2\sqrt{k}. \text{ Therefore, } k = 2.$$

4. **Level:** Easy | **Domain:** GEOMETRY AND TRIGONOMETRY  
**Skill/Knowledge:** Area and volume | **Testing point:** Finding the area of a rectangle

**Key Explanation:** Choice D is correct. The length of the rectangle is  $(x - 6)$  and the width is  $x$ . The area of a rectangle is given by length  $\times$  width which is  $x(x - 6) = 27$ .

Using distributive property yields  $x^2 - 6x = 27$ .

Subtracting 27 from both sides of the equation yields  $x^2 - 6x - 27 = 0$ . Solve the quadratic equation either by using the quadratic formula or by using the factor method.

Factoring  $x^2 - 6x - 27 = 0$  yields  $(x + 3)(x - 9) = 0$ .

Equating  $(x + 3)$  to zero yields  $x + 3 = 0$  or  $x = -3$ .

Equating  $(x - 9)$  to zero yields  $x - 9 = 0$  or  $x = 9$ .

Since the width cannot be negative, the width would therefore be 9. Solving for the length of the rectangle yields  $9 - 6 = 3$ .

**Distractor Explanations:** **Choice A** is incorrect. This is the value of  $x$  or the width of the rectangle. **Choice B** is incorrect and may result from a conceptual or calculation error. **Choice C** is incorrect. This is the difference between the length and the width of the rectangle.

5. **Level:** Easy | **Domain:** ALGEBRA  
**Skill/Knowledge:** Linear equations in one variable  
**Testing point:** Solving for  $x$  in a linear equation

**Key Explanation:** **Choice A** is correct. Solve for  $x$  first in the given equation  $7x + 14 = 7$ . Subtracting 14 from both sides of the equation yields  $7x = 7 - 14$  or  $7x = -7$ . Dividing both sides of the equation by 7 yields  $x = -1$ . The equivalent equation will also have the same value of  $x$ . Solve the value of  $x$  in choice A by subtracting 6 from both sides of the equation which yields  $3x = 3 - 6$  or  $3x = -3$ . Dividing both sides of the equation by 3 yields  $x = -1$ . Therefore,  $3x + 6 = 3$  is equal to  $7x + 14 = 7$ .

**Distractor Explanations:** **Choices B** and **C** are incorrect. Solving the value of  $x$  from both equations yields  $x = 3$ . **Choice D** is incorrect. Solving the value of  $x$  from  $7x = 7$  yields  $x = 1$ .

6. **Level:** Hard | **Domain:** ALGEBRA  
**Skill/Knowledge:** Linear inequalities in one or two variables | **Testing point:** Solving absolute value inequalities

**Key Explanation:** To solve for the values of  $x$ , make two inequalities of absolute value for the positive and negative values.

$$\begin{array}{ll} +|x+3| < +7 & -|x+3| < +7 \\ x+3 < 7 & -x-3 < 7 \\ x+3-3 < 7-3 & -x-3+3 < 7+3 \\ x < 4 & -x < 10, \text{ divide both sides by } -1 \end{array}$$

$$x > -10$$

Hence,  $-10 < x < 4$ . The integers between  $-10$  and  $4$  are  $-9, -8, -7, -6, -5, -4, -3, -2, -1, 0, 1, 2$  and  $3$ .

Therefore, there are 13 integer solutions in the given inequality.

7. **Level:** Easy | **Domain:** ADVANCED MATH  
**Skill/Knowledge:** Nonlinear functions | **Testing point:** Finding a value of an exponential function

**Key Explanation:** **Choice A** is correct.

Substituting  $\frac{1}{3}$  to the given equation yields

$$p\left(\frac{1}{3}\right) = \left\{\frac{1}{8}\right\}^{-\frac{1}{3}} = 8^{\frac{1}{3}} = \sqrt[3]{8} = 2$$

Therefore,  $p\left(\frac{1}{3}\right) = 2$ .

**Distractor Explanations:** **Choice B** is incorrect. This option may be a result of finding  $p(3)$ . **Choice C** is incorrect and may result from solving the value of  $p\left(-\frac{1}{3}\right)$ . **Choice D** is incorrect. This option may be a result of finding  $p(-3)$ .

8. **Level:** Medium | **Domain:** ADVANCED MATH  
**Skill/Knowledge:** Nonlinear functions | **Testing point:** Using the factor theorem

**Key Explanation:** **Choice C** is correct. Factor theorem states that if  $f(a) = 0$ , then  $x - a$  is a factor of  $f(x)$ . In **Choice C**,  $a = 2$ . Substituting 2 to the given equation yields  $f(2) = 6(2)^2 - 17(2) + 10$ . Using distributive property yields  $f(2) = 24 - 34 + 10$  or  $f(2) = 0$ . This means that  $x - 2$  is a factor of  $f(x)$ .

**Distractor Explanations:** **Choice A** is incorrect.

Substituting  $-\frac{5}{6}$  to the given equation yields

$$f\left(-\frac{5}{6}\right) = 6\left(-\frac{5}{6}\right)^2 - 17\left(-\frac{5}{6}\right) + 10 = \frac{25}{6} + \frac{85}{3}$$

**Choice B** is incorrect. Substituting  $-5$  to the given equation yields 245. **Choice D** is incorrect. Substituting 5 to the given equation yields 75.

9. **Level:** Easy | **Domain:** PROBLEM-SOLVING AND DATA ANALYTICS  
**Skill/Knowledge:** One-variable data: distributions and measures of center and spread |  
**Testing point:** Interpreting box and whisker plots

**Key Explanation:** **Choice D** is correct. The median in a box and whisker plot is represented by the line in the box (interquartile range). From the above, Date Set A has a median of data set B has a greater median compared to data set A.

**Distractor Explanations:** **Choice A** and **Choice B** are incorrect. The mean and number of data or frequency cannot be found from a box and whisker plot representation. **Choice C** is incorrect. This statement is false.

10. **Level:** Easy | **Domain:** ADVANCED MATH  
**Skill/Knowledge:** Nonlinear equations in one variable and systems of equations in two variables  
**Testing point:** Finding the vertex of a parabola through a transformation

**Key Explanation:** The vertex of  $f(x)$  is  $(-2, 5)$ . Translating the parabola 3 units to the left and 1 unit up would result in  $(-5, 6)$ , which is the vertex of  $g(x)$ . Therefore, the value of  $h$  is  $-5$ .

11. **Level:** Easy | **Domain:** PROBLEM-SOLVING AND DATA ANALYSIS  
**Skill/Knowledge:** Two-variable data: models and scatterplots | **Testing point:** Using the line of best fit

**Key Explanation:** **Choice C** is correct. The points above the line of best fit have a higher value than the values predicted by the line of best fit. There are 6 points above the line.

**Distractor Explanations:** **Choice A** is incorrect and may result from counting the total points in the scatter plot. **Choice B** is incorrect and may result from counting the points below the line. **Choice D** is incorrect. This option may result from conceptual errors.

12. **Level:** Easy | **Domain:** ADVANCED MATH  
**Skill/Knowledge:** Equivalent expressions |  
**Testing point:** Using the difference of two squared with binomial expressions

**Key Explanation:** **Choice D** is correct. Rewriting the expression  $(x + \sqrt{2})^2(x - \sqrt{2})^2$  yields

$\left[(x + \sqrt{2})(x - \sqrt{2})\right]^2$ . Using  $(a + b)(a - b) = a^2 - b^2$  yields

$\left[(x + \sqrt{2})(x - \sqrt{2})\right]^2 = (x^2 - (\sqrt{2})^2)^2$ . Simplifying the radicals yields  $(x^2 - 2)^2$ . Expanding the expression yields  $x^4 - 4x^2 + 4$ .

**Distractor Explanations:** **Choices A, B, and C** are incorrect and may result from a conceptual or calculation error

13. **Level:** Easy | **Domain:** ALGEBRA  
**Skill/Knowledge:** Linear functions | **Testing point:** Finding the equation of a line from a graph

**Key Explanation:** **Choice A** is correct. The graph decreases from left to right. This means that the line has a negative slope. Looking at the choices, only **Choice A** has a negative slope of  $-4.85$ . Therefore,  $y = 231 - 4.85x$  is the equation of the graph.

**Distractor Explanations:** Choices B, C, and D are incorrect. These equations have positive values of slopes.

14. **Level:** Medium | **Domain:** PROBLEM SOLVING AND DATA ANALYSIS  
**Skill/Knowledge:** Percentages | **Testing point:** Using proportions and percentages

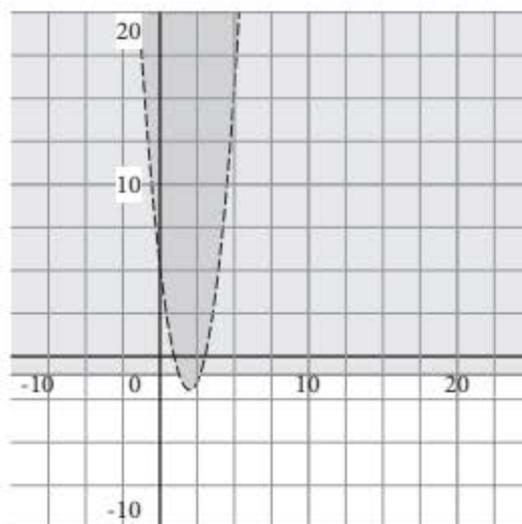
**Key Explanation:**

|                       | Girls                        | Boys                         |
|-----------------------|------------------------------|------------------------------|
| On the track team     | 6                            | $\frac{3}{5} \times 20 = 12$ |
| Not on the track team | $\frac{3}{4} \times 24 = 18$ | 8                            |
|                       | 24                           | 20                           |

From the table, the number of students on the track team would be  $6 + 12 = 18$  out of the 44 students. In percentage form this would be  $\frac{18}{44} \times 100 = 40.909\%$  or 41% rounded off to the nearest whole number.

15. **Level:** Easy | **Domain:** ADVANCED MATH  
**Skill/Knowledge:** Nonlinear equations in one variable and systems of equations in two variables  
**Testing point:** Solving for quadratic and linear inequalities

**Key Explanation:** Choice D is correct. The inequality  $y > 2(x - 2)^2 - 2$  has a graph of parabola. This means that it is in the form  $y > a(x - h)^2 + k$  where  $(h, k)$  is the vertex. Hence, the vertex is at  $(2, -2)$ . Since the value  $a$  is positive, the parabola opens upwards. This means that the lowest point of the graph is the vertex. Hence, the value of  $y$  must be greater than  $-2$ .



However, the second inequality states that  $y \geq -1$ , making  $-1$  the least value of  $y$ .

**Distractor Explanations:** Choices A and C are incorrect. These are solutions to the system. However, they are not the least value of  $y$ . Choice B is incorrect. The option is not part of the solutions of the system.

16. **Level:** Hard | **Domain:** ADVANCED MATH  
**Skill/Knowledge:** Equivalent expressions |  
**Testing point:** Factoring a quadratic

**Key Explanation:** Choice A is correct. Adding 98 to both sides of the equation yields  $2x^2 + 28x + 98 = 0$ . Factoring out 2 yields  $2(x^2 + 14x + 49) = 0$ . Using the model  $(a + b)^2 = a^2 + 2ab + b^2$ , the expression  $(x^2 + 14x + 49)$  can be written as  $(x + 7)^2$ . Hence, the equation becomes  $2(x + 7)^2 = 0$ . Therefore, only equation 1 is equal to the given equation.

**Distractor Explanations:** Choices B and C are incorrect. This is because equation two is not equivalent to the given equation. Choice D is incorrect. This is because only equation 2 is not equivalent and not both of them.

17. **Level:** Easy | **Domain:** ALGEBRA

**Skill/Knowledge:** Systems of two linear equations in two variables | **Testing point:** Solving simultaneous equations

**Key Explanation:** The system of equations above can be solved either by substitution or elimination. Using elimination method, the 1<sup>st</sup> equation is multiplied by 2 which yields  $2(3y - 2x = 6)$  or  $6y - 4x = 12$ .

Subtract the two equations yields  $y = 4$ .

Substituting the value of  $y$  to the first equation yields  $3(4) - 2x = 6$  or  $12 - 2x = 6$ .

Adding  $2x$  and subtracting 6 from both sides of the equation yields  $12 - 6 = 2x$  or  $6 = 2x$ .

Dividing both sides of the equation by 2 yields  $3 = x$  or  $x = 3$ .

Therefore,  $2x + y$  is  $2(3) + 4 = 6 + 4 = 10$ .

18. **Level:** Medium | **Domain:** PROBLEM SOLVING AND DATA ANALYSIS

**Skill/Knowledge:** Inference from sample statistics and margin of error | **Testing point:** Making inferences from sample to population

**Key Explanation:** Choice B is correct. From the survey,  $\frac{53}{97}$  of the students surveyed are in favor of changing the school uniform. This means that  $97 - 53 = 44$  or 44 of 97 students are not in favor of changing the school uniform. To approximate the number of students in school that are not in favor of the change would be  $\frac{44}{97} \times 2,300 = 1,043$ .

**Distractor Explanations:** Choice A is incorrect. This would be the approximate number of students in school that are in favor of the change in uniform. Choice C is incorrect. This is the total number of students in the school. Choice D is incorrect. This option may result from miscalculation or conceptual error.

19. **Level:** Easy | **Domain:** ALGEBRA

**Skill/Knowledge:** Systems of two linear equations in two variables | **Testing point:** Working with systems of linear equations with no solution

**Key Explanation:** Choice B is correct. A system of equations with no solutions means that the lines are parallel. They have the same slope but different  $y$  intercepts. Using distributive property yields

$$3x + 5 - \frac{8}{3x} - 8 = px + 4$$

Simplifying the left side of the equation yields  $\frac{1}{3}$

$x - 3 = px + 4$ . Matching the coefficients of  $x$  yields

$$p = \frac{1}{3}.$$

**Distractor Explanations:** Choices A, C and D are incorrect. These options would result in having a system of equations with one solution.

20. **Level:** Medium | **Domain:** ALGEBRA

**Skill/Knowledge:** Linear equations in two variables | **Testing point:** Solving a system of equations with Infinite solutions

**Key Explanation:** A system of equations with infinite solutions are equations of the same line and have both the same slope and  $y$ -intercept. Using distributive property yields  $5x - 10 + x + 3 = kx - 2k + 2x + 1$ . Combining and grouping like terms yields  $6x - 7 = (kx + 2x) + (-2k + 1)$ .

Matching the constants yields  $-7 = -2k + 1$ .

Adding 7 and  $2k$  to both sides of the equation yields  $2k = 8$ .

Dividing both sides of the equation by 2 yields  $k = 4$ .

21. **Level :** Easy | **Domain:** GEOMETRY AND TRIGONOMETRY  
**Skill/Knowledge:** Lines, angles, and triangles |  
**Testing point:** Working with inscribed shapes and special triangles

**Key Explanation:** Choice D is correct. The diameter of the circle is equal to the diagonal length of the square. The diameter is  $12 \times 2 = 24$  cm, which means that the diagonal of the square is also 24. And since the diagonal length is equal to  $s\sqrt{2}$  where  $s$  is the side length of the square, then  $s\sqrt{2} = 24$ . Solving for  $s$  by dividing both sides of the equation by  $\sqrt{2}$  yields  $s = \frac{24}{\sqrt{2}}$ . Rationalizing the denominator yields  $s = \frac{24}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{24\sqrt{2}}{2} = 12\sqrt{2}$ . Therefore,  $s = 12\sqrt{2}$ .

**Distractor Explanations:** Choice A is incorrect. This is the value of the diameter of the circle. Choice B is incorrect. This is the value of the radius of the circle. Choice C is incorrect. This option would be a result of misconception and conceptual error.

22. **Level :** Hard | **Domain:** ALGEBRA  
**Skill/Knowledge:** Linear equations in two variables | **Testing point:** Determining the equation of a line from data

**Key Explanation:** Choice B is correct. The value of  $y$  is constant for all values of  $x$  given; thus the equation of the line would be  $y = 4$ . Substituting the value of  $y$  to the given equation yields  $4 = 2k$ . Dividing both sides of the equation by 2 yields  $2 = k$  or  $k = 2$ .

**Distractor Explanations:** Choice A is incorrect. This is the value of the constant  $2k$ . Choices C

and D are incorrect. These options may be due to conceptual and miscalculation errors.

1. **Level:** Medium | **Domain:** ADVANCED MATH  
**Skill/Knowledge:** Nonlinear equations in one variable and systems of equations in two variables  
**Testing point:** Solving quadratic equations

**Key Explanation:** Choice C is correct. Quadratic equations can be solved either by using the quadratic formula or by solving using the factor method.

Using the factor method, first find the product of the highest degree term and the constant which will be  $3x^2 \times 6 = 18x^2$ .

The factors of  $18x^2$  that will add up to be equal to the middle term  $-19x$  are  $-x$  and  $-18x$ .

Splitting the middle term yields  $3x^2 - x - 18x + 6 = 0$ .

Grouping the equation yields  $(3x^2 - x) - (18x - 6) = 0$ .

Factoring the equation yields  $x(3x - 1) - 6(3x - 1) = 0$ .

Factoring out  $(3x - 1)$  yields  $(3x - 1)(x - 6) = 0$ .

Equating  $(x - 6)$  to zero yields  $x - 6 = 0$  or  $x = 6$ .

Equating  $(3x - 1)$  to zero yields  $3x - 1 = 0$  or  $x = \frac{1}{3}$ .

Since  $\frac{1}{3}$  is in the options, then **Choice C** is the correct answer.

**Distractor Explanations:** **Choice A** is incorrect. This is the negative value of the solution  $= 6$ .

**Choice B** is incorrect. This is the value of the products of the solutions/roots which is  $(c/a)$ .

**Choice D** is incorrect. This is the negative value of the solution  $x = 1/3$ .

2. **Level:** Medium | **Domain:** GEOMETRY AND TRIGONOMETRY  
**Skill/Knowledge:** Circles | **Testing point:** Completing the square and using the equation of a circle

**Key Explanation:** **Choice B** is correct. Diameter is twice the radius. To find the radius of the circle, rewrite the given equation in standard form  $(x - h)^2 + (y - k)^2 = r^2$  where  $(h, k)$  is the center of the circle and  $r$  is its radius. Completing the squares

yields  $(x - 4)^2 - \left(\frac{-8}{2}\right)^2 + (y + 5)^2 - \left(\frac{10}{2}\right)^2 = 8$  or

$(x - 4)^2 - 16 + (y + 5)^2 - 25 = 8$ . Adding 25 and 16 to both sides of the equation yields  $(x - 4)^2 + (y + 5)^2 = 8 + 25 + 16$  or  $(x - 4)^2 + (y + 5)^2 = 49$ .

Since  $r^2 = 49$ , then  $r = 7$ .

The diameter would then be  $2(7) = 14$ .

**Distractor Explanations:** **Choice A** is incorrect. This is the value of the radius of the circle given above. **Choice C** is incorrect. This assumes that 8 is the radius of the circle and that the diameter would be  $2(8) = 16$ . **Choice D** is incorrect. This can be a result of not getting the square root of the constant in the equation.

3. **Level:** Easy | **Domain:** ALGEBRA  
**Skill/Knowledge:** Linear functions | **Testing point:** Solving for the absolute value of a linear function  $f(x)$ , given  $x$

**Key Explanation:** To find  $f(2)$ , substitute 2 in place of  $x$  in the equation which yields  $f(2) = -2(2) - 6$ .

Simplifying the equation yields  $f(2) = -4 - 6$  or  $f(2) = -10$ .

$|f(2)|$  is the absolute value of  $f(2)$ .

Therefore,  $|-10| = 10$ .

4. **Level:** Hard | **Domain:** GEOMETRY AND TRIGONOMETRY  
**Skill/Knowledge:** Right triangles and trigonometry | **Testing point:** Using trigonometric identities

**Key Explanation:** Choice B is correct. Converting the tangent function to sine and cosine functions

yields  $\tan(90 - x)^\circ = \frac{\sin(90 - x)^\circ}{\cos(90 - x)^\circ}$ . Since the

sine of an angle is equal to the cosine of its complementary angle and vice versa,  $\sin x = \cos(90 - x)$  and  $\cos x = \sin(90 - x)$ . Substituting the equivalent identities yields

$\tan(90 - x) = \frac{\cos x}{\sin x}$ . Therefore, the correct answer

is Choice B.

**Distractor Explanations:** Choices A and C are incorrect and may result from solving the equivalent identity of  $\tan x$  and  $\frac{1}{\tan x}$  respectively.

Choice D is incorrect and may result from solving the equivalent identity of  $\tan(-x)$ .

5. **Level:** Easy | **Domain:** ALGEBRA  
**Skill/Knowledge:** Linear functions | **Testing point:** Meaning in context in linear equation  
**Key Explanation:** Choice C is correct. Alina earns an interest monthly based on her deposit. This makes the model equation for her savings account linear. 7.684 in this context, is the amount of interest she earns monthly which can be obtained by multiplying the interest rate with the principal amount. This yields  $(6.8\% \times 113) = 7.684$ . Thus making option C correct.  
**Distractor Explanations:** Choice A is incorrect. The amount of interest earned after  $t$  months would be represented by  $7.684t$ . Choice B is incorrect. The total amount in the account after  $t$  months would be represented by the function  $A(t)$ . Choice D is incorrect. The interest earned per year is \$92.208.
6. **Level:** Medium | **Domain:** ALGEBRA  
**Skill/Knowledge:** Systems of two linear equations in two variables | **Testing point:** System of linear equations

**Key Explanation:** Choice B is correct. A system of equations with no solution are systems that have parallel lines and therefore have the same slope and different  $y$ -intercepts. To find the slope and  $y$ -intercept of the given equation, the equation has to be in the slope-intercept form  $y = mx + c$ .

Subtracting  $-6x$  from the equation yields  $-3y = -6x + 2$ . Dividing  $-3$  from both sides of the equation yields  $y = 2x - \frac{2}{3}$ . The slope is 2 and the  $y$ -intercept is  $-\frac{2}{3}$ .

Rewriting Choice C in slope intercept form yields  $y = 2x + 4$ . Since it has the same slope and different  $y$ -intercept with the given line, both lines are parallel and will have no solutions.

**Distractor Explanations:** Choice A is incorrect.

The line has a different slope of  $\frac{2}{3}$ , which makes the system have one solution. Choices C and D are incorrect. Both lines have a slope of 2 and  $y$ -intercept is  $-\frac{2}{3}$  which is the same as the given line. Hence, both lines are collinear which makes the system have infinite solutions.

7. **Level:** Easy | **Domain:** ADVANCED MATH  
**Skill/Knowledge:** Nonlinear functions | **Testing point:** Solving for  $p(x)$  given  $x$  in a quadratic function  
**Key Explanation:** To find  $p(2)$ , substitute 2 in place of  $x$ . This yields  $p(2) = 2(2)^2 - 6(2) + 5$ . Simplifying the equation yields  $p(2) = 8 - 12 + 5$  or  $p(2) = 1$ .
8. **Level:** Easy | **Domain:** ALGEBRA  
**Skill/Knowledge:** Linear equations in two variables | **Testing point:** Finding the equation of the line given two points

**Key Explanation:** Choice B is correct. To find the equation of the line, first find the slope of the line. Substituting (6, 5) and (0, 0) to the slope formula

$m = \frac{y_2 - y_1}{x_2 - x_1}$  yields  $m = \frac{0 - 5}{0 - 6} = \frac{5}{6}$ . Substituting the

slope to the slope-intercept form  $y = mx + b$  yields

$y = \frac{5}{6}x + b$ . Since the line passes through the

origin, the *y*-intercept is zero which means  $b = 0$ .

Hence, the equation of the line is  $y = \frac{5}{6}x$  or

$6y = 5x$ , which makes B the correct option.

**Distractor Explanations:** Choice A is incorrect and may result from finding the equation of the line that passes through the origin and point (5, 6). Choices C and D are incorrect. These lines do not pass through the origin and point (6, 5).

9. **Level:** Easy | **Domain:** ADVANCED MATH  
**Skill/Knowledge:** Nonlinear functions | **Testing point:** Determining a quadratic equation from its graph

**Key Explanation:** Choice D is correct. The graph opens downwards and this makes a (the coefficient of  $x^2$ ) negative. Hence, the possible answer is either choice C or D. To determine which is correct between choice C and choice D, check the value of  $h$  for each equation using the formula  $\frac{-b}{2a}$

where  $b$  is the coefficient of  $x$ . Since the vertex of the graph is in the first quadrant, then  $h$  must be positive. Solving  $h$  in Choice C yields  $\frac{-(-6)}{2(-2)}$  or

$-\frac{3}{2}$ . Hence, Choice C is incorrect. Solving  $h$  in

choice D yields  $\frac{-(-6)}{2(-2)}$  or  $\frac{3}{2}$ . Therefore, Choice D is the correct answer.

**Distractor Explanations:** Choices A and B are incorrect. The graph of these equations opens upwards since the coefficient of  $x^2$  is positive.

Choice C is incorrect because the value of  $h$  is negative.

10. **Level:** Easy | **Domain:** GEOMETRY AND TRIGONOMETRY

**Skill/Knowledge:** Lines, angles and triangles |

**Testing point:** Using the sum of the interior angles of a polygon formula

**Key Explanation:** A quadrilateral is a four sided figure. The sum of the interior angles can be found by  $180(n - 2)$  where  $n$  is the number of sides. Substituting 4 yields  $180(4 - 2) = 360^\circ$ .

Adding the given angles yields

$$x + x + 40 + x + 50 + x - 10 = 360.$$

Combining like terms yields  $4x + 80 = 360$ .

Subtracting 80 from both sides of the equation yields  $4x + 80 - 80 = 360 - 80$  or  $4x = 280$ .

Dividing both sides of the equation by 4 yields  $x = 70^\circ$ .

11. **Level:** Medium | **Domain:** GEOMETRY AND TRIGONOMETRY

**Skill/Knowledge:** Right triangles and trigonometry | **Testing point:** Using

SOHCAHTOA in similar right triangles

**Key Explanation:** Choice A is correct. Triangle ABD and Triangle ACD are similar right triangles. This makes angle CAD and angle DBA equal. Therefore,  $\sin CAD = \sin DBA$ .

Since  $\sin DBA = \frac{O}{H} = \frac{AD}{BD}$ , then  $\sin CAD = \frac{AD}{BD}$

BD is the hypotenuse for triangle ABD which can be calculated using Pythagorean Theorem  $a^2 + b^2 = c^2$ , where  $a$  and  $b$  are the legs and  $c$  is the hypotenuse of the right triangle. Applying

this to triangle  $ABD$  yields  $AB^2 + AD^2 = BD^2$ . Substituting the values of  $AB$  and  $AD$  yields  $10^2 + 24^2 = BD^2$ . Simplifying the left side of the equation yields  $676 = BD^2$ . Getting the square root of both sides of the equation yields  $\sqrt{676} = BD$  or  $26 = BD$ . Substituting the value of  $AD$  and  $BD$

to  $\sin CAD = \frac{AD}{BD}$  yields  $\sin CAD = \frac{24}{26}$  or  $\sin$

$$CAD = \frac{12}{13}.$$

**Distractor Explanations:** **Choice B** is incorrect. This option is the value of  $\tan CAD$ . **Choice C** is incorrect. This option is the value of  $\cos CAD$ . **Choice D** is incorrect. This option is the value of  $\tan CDA$ .

12. **Level:** Easy | **Domain:** ADVANCED MATH

**Skill/Knowledge:** Equivalent expressions | **Testing point:** Using the distributive property

**Key Explanation:** **Choice B** is correct. Using distributive property yields  $7wp(2w) + 7wp(5)$ . Simplifying the expression yields  $14w^2p + 35wp$ .

**Distractor Explanations:** **Choices A, C, and D** are incorrect and may result from a conceptual or calculation error.

13. **Level:** Easy | **Domain:** GEOMETRY AND TRIGONOMETRY

**Skill/Knowledge:** Area and volume | **Testing point:** Using volumes of similar shapes

**Key Explanation:** The ratio of volume of sphere  $A$  and sphere  $B$  is  $27 : 1$ . The ratio of the radius would be  $\sqrt[3]{27} : \sqrt[3]{1} = 3 : 1$ . Sphere  $B$  has a radius of  $4$  cm. Applying the ratio of  $3 : 1$ , this would make the radius of sphere  $A$   $3 \times 4 = 12$ .

14. **Level:** Hard | **Domain:** PROBLEM-SOLVING AND DATA ANALYSIS

**Skill/Knowledge:** Probability and conditional probability | **Testing point:** Calculating probabilities

**Key Explanation:** **Choice C** is correct.

|          | Rain | No rain |
|----------|------|---------|
| Monday   | 43%  | 57%     |
| Thursday | 86%  | 14%     |

Probability is equal to one or 100% (if in percentage form), therefore the chance that it won't rain on Monday will be  $100\% - 43\% = 57\%$ . Since it is twice as likely to rain on Thursday than on Monday, the chance that it will rain on Thursday will be  $2(43\%) = 86\%$ . Hence, the chance that it would not rain on Thursday is  $100\% - 86\% = 14\%$  or  $0.14$ .

**Distractor Explanations:** **Choice A** is incorrect. This is the value of the probability that it would rain on Monday. **Choice B** is incorrect as this is the chance that it would not rain on Monday. **Choice D** is incorrect as this is the chance that it would rain on Thursday.

15. **Level:** Hard | **Domain:** ADVANCED MATH

**Skill/Knowledge:** Nonlinear equations in one variable and systems of equations in two variables | **Testing point:** Solving nonlinear inequalities

**Key Explanation:** **Choice B** is correct. To solve the following system, the bases have to be the same. Since  $16$  and  $4$  are multiples of  $2$ ,  $16^x$  becomes  $2^{4x}$  and  $4^x$  becomes  $2^{2x}$ . This yields  $\frac{2^{4x}}{2^{2x}} > 2$ . Since the terms on the left side of the inequality are divided, their exponents will be subtracted which will yield  $2^{4x-2x} > 2^6$  or  $2^{2x} > 2^6$ . Since the bases are the same, then  $2x > 6$ . Dividing both sides of the inequality by  $2$  yields  $x > 3$ .  $4$  is the next integer greater than  $3$ .

**Distractor Explanations:** Choices A, C, and D are incorrect as they are all less than 3 or equal to 3.

16. **Level:** Hard | **Domain:** ADVANCED MATH  
**Skill/Knowledge:** Equivalent expressions |  
**Testing point:** Matching coefficients and solving systems of equations

**Key Explanation:** Using distributive property yields  $3ax - 3b + 4bx - 4a = x - 6$ . Grouping like terms yields  $(3a + 4b)x + (-3b - 4a) = x - 6$ . Matching the coefficients of  $x$  and the constants to make two equations yields  $3a + 4b = 1$  and  $-4a - 3b = -6$ . Using the elimination method to find the value of  $a$  and  $b$ , multiply the 1<sup>st</sup> equation by 4 and the 2<sup>nd</sup> equation by 3. This yields  $4(3a + 4b = 1)$  or  $12a + 16b = 4$  and  $3(-4a - 3b = -6)$  or  $-12a - 9b = -18$ . Adding the two equations yields  $7b = -14$ . Dividing both sides of the equation by 7 yields  $b = -2$ . Substituting the value of  $b$  to the 1<sup>st</sup> equation yields  $3a + 4(-2) = 1$  or  $3a - 8 = 1$ . Adding 8 to both sides of the equation yields  $3a = 9$ . Dividing both sides of the equation by 3 yields  $a = 3$ .

17. **Level:** Easy | **Domain:** GEOMETRY AND TRIGONOMETRY

**Skill/Knowledge:** Area and volume | **Testing point:** Finding the volume of a cone

**Key Explanation:** Choice B is correct. The volume of a cone is given by the formula  $\left(\frac{1}{3}\pi r^2 h\right)$  where  $r$  is the radius and  $h$  is the height. Since the height is 6 more than the radius,  $h = 12 + 6 = 18$ . Substituting the values to the formula yields  $\frac{1}{3}\pi(12)^2(18) = 864\pi$ .

**Distractor Explanations:** Choice A is incorrect because this gives the volume of a cylinder with the given parameters. Choices C and D are incorrect. These options may result from miscalculation or by using the wrong formula.

18. **Level:** Easy | **Domain:** ALGEBRA  
**Skill/Knowledge:** Linear equations in two variables | **Testing point:** Finding the slope of a line from an equation

**Key Explanation:** Choice A is correct. To find the slope of the line, rewrite the equation in slope intercept form  $y = mx + c$ , where  $m$  is the slope and  $c$  is the  $y$ -intercept. Adding  $3y$  and subtracting 6 from both sides of the equation yields  $4x - 6 = 3y$ . Dividing both sides of the equation by 3 yields  $\frac{4}{3}x - 2 = y$  or  $y = \frac{4}{3}x - 2$ . Therefore, the slope of the line is  $\frac{4}{3}$ .

**Distractor Explanations:** Choice B is incorrect because this is the coefficient of  $x$  when the equation of the line is in general form. Choices C and D are incorrect and may result from a conceptual or calculation error.

19. **Level:** Medium | **Domain:** GEOMETRY AND TRIGONOMETRY

**Skill/Knowledge:** Circles | **Testing point:** Calculating angle measure given arc length

**Key Explanation:** The arc length is a fraction of the circumference. The arc would therefore be

$$\frac{3\pi}{20\pi} = \frac{3}{20}$$

Multiplying it to the full angle of a circle yields

$$\frac{3}{20} \times 360^\circ = 54^\circ$$

20. **Level:** Easy | **Domain:** PROBLEM SOLVING AND DATA ANALYSIS

**Skill/Knowledge:** Ratios, rates, proportional relationships, and units | **Testing point:** Using inverse proportions

**Key Explanation:** Choice B is correct. The price per student would be  $\frac{p}{30}$ . If 28 students paid before the day of the trip, then this can be represented by  $\frac{p}{30} \times 28 = \frac{28p}{30}$  or  $\frac{14}{15}p$ .

**Distractor Explanations:** Choices A and C are incorrect and may result from assuming that  $p$  is the price per student. Choice D is incorrect and may result from solving the price per student.

21. **Level:** Hard | **Domain:** GEOMETRY AND TRIGONOMETRY

**Skill/Knowledge:** Circles | **Testing point:** Finding the equation of a circle

**Key Explanation:** Choice C is correct. The standard form of the equation of a circle is  $(x - h)^2 + (y - k)^2 = r^2$ , where  $(h, k)$  is the center of the circle and  $r$  is the radius. Substituting the given data yields  $(x + 3)^2 + (y - 5)^2 = 6^2$ . Expanding the equation yields  $x^2 + 6x + 9 + y^2 - 10y + 25 = 36$ . Subtracting 36 from both sides of the equation yields  $x^2 + 6x + y^2 - 10y + 34 - 36 = 0$ . Matching the constant in  $x^2 + 6x + y^2 - 10y - 2 = ax^2 + bx + cy^2 + dy + e$  yields  $e = -2$ .

**Distractor Explanations:** Choices A and D are incorrect. These options may result from conceptual errors. Choice B is incorrect. This is the value of  $r^2 = 6^2 = 36$ , however it is not the value of  $e$ .

22. **Level:** Medium | **Domain:** ALGEBRA

**Skill/Knowledge:** Linear inequalities in one or two variables | **Testing point:** Solving for a linear inequality

**Key Explanation:** Choice D is correct. Using distributive property yields  $-3x - 6 < 2x - 16$ . Adding 6 and subtracting  $2x$  from both sides of the inequality yields  $-3x - 6 - 2x + 6 < 2x - 16 + 6 - 2x - 5x < -10$ . Dividing both sides of the inequality by  $-5$  yields  $x > 2$ . Since 3 is greater than 2, it is the correct answer.

**Distractor Explanations:** Choices A, B and C are incorrect. These values are less than or equal to 2.