PSAT/NMSQT Practice Test #1

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PSAT/NMSQT®

Preliminary SAT/National Merit Scholarship Qualifying Test

Practice Test #1

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GENERAL DIRECTIONS

- You may work on only one module at a time.

- If you finish a module before time is called, check your work on that module only. You may NOT turn to any other module.

TIMING

Reading and Writing, Module 1: 39 minutes

Reading and Writing, Module 2: 39 minutes

10-minute break

Math, Module 1: 43 minutes

Math, Module 2: 43 minutes

The above are standard times. If you are approved for accommodations involving additional time, you should give yourself that time when you practice.

MARKING YOUR ANSWERS

- Be sure to answer your questions properly in this book.

- Circle only one answer to 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.

USING YOUR TEST BOOK

- You may use the test book for scratch work.

- You may not fold or remove pages or portions of a page from this book, or take the book from the testing room.

Reading and Writing
33 QUESTIONS

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 following text is adapted from Amy Lowell's 1912 poem "Summer."

It is summer, glorious, deep-toned summer,
The very crown of nature's changing year
When all her surging life is at its full.
To me alone it is a time of pause,
A void and silent space between two worlds,
When inspiration lags, and feeling sleeps,
Gathering strength for efforts yet to come.

As used in the text, what does the phrase "a void" most nearly mean?

A) A useless

B) An empty

C) A forgotten

D) An incomplete

2

In the 1960s, Sam Gilliam, a Black painter from the southern United States, became the first artist to drape painted canvases into flowing shapes. He later explored a different style, _____ quilt-like paintings inspired by the patchwork quilting tradition of Black communities in the South.

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

A) predicting

B) refusing

C) hiding

D) creating

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2

CONTINUE

3

Studying how workload affects productivity, Maryam Kouchaki and colleagues found that people who chose to do relatively easy tasks first were less _____ compared to those who did hard tasks first. Finishing easy tasks gave participants a sense of accomplishment, but those who tackled hard tasks first actually became more skilled and productive workers over time.

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

A) secretive

B) efficient

C) outgoing

D) unsympathetic

4

The following text is from Bram Stoker's 1897 novel *Dracula*. The narrator is being driven in a carriage through a remote region at night.

The baying of the wolves sounded nearer and nearer, as though they were closing round on us from every side. I grew dreadfully afraid, and the horses shared my fear. The driver, however, was not in the least <u>disturbed</u>; he kept turning his head to left and right, but I could not see anything through the darkness.

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

A) Disorganized

B) Alarmed

C) Offended

D) Interrupted

5

The following text is adapted from Sadakichi Hartmann's 1894 short story "Magnolia Blossoms." The narrator is standing on the deck of a boat.

What a night it was! My soul had left its body to lose itself in the wild unrestrained beauty around me—from where it came—and only left a trembling <u>suggestion</u> of its existence within me. The other passengers moved around me like shadows, and again and again my eyes drank in all the glory and wealth of that night.

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

A) Trace

B) Opinion

C) Dispute

D) Command

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3

CONTINUE

6

The following text is from Lucy Maud Montgomery's 1908 novel *Anne of Green Gables*. Anne, an eleven-year-old girl, has come to live on a farm with a woman named Marilla in Nova Scotia, Canada.

> Anne reveled in the world of color about her.
>
> "Oh, Marilla," she exclaimed one Saturday morning, coming dancing in with her arms full of gorgeous boughs, "I'm so glad I live in a world where there are Octobers. It would be terrible if we just skipped from September to November, wouldn't it? Look at these maple branches. Don't they give you a thrill—several thrills? I'm going to decorate my room with them."
>
> "Messy things," said Marilla, whose aesthetic sense was not noticeably developed. "You clutter up your room entirely too much with out-of-doors stuff, Anne. Bedrooms were made to sleep in."

Which choice best states the main purpose of the text?

A) To demonstrate that Anne has a newly developed appreciation of nature

B) To describe an argument that Anne and Marilla often have

C) To emphasize Marilla's disapproval of how Anne has decorated her room

D) To show that Anne and Marilla have very different personalities

7

Early in the Great Migration of 1910–1970, which involved the mass migration of Black people from the southern to the northern United States, political activist and *Chicago Defender* writer Fannie Barrier Williams was instrumental in helping other Black women establish themselves in the North. Many women hoped for better employment opportunities in the North because, in the South, they faced much competition for domestic employment and men tended to get agricultural work. To aid with this transition, Barrier Williams helped secure job placement in the North for many women before they even began their journey.

Which choice best states the main purpose of the text?

A) To introduce and illustrate Barrier Williams's integral role in supporting other Black women as their circumstances changed during part of the Great Migration

B) To establish that Barrier Williams used her professional connections to arrange employment for other Black women, including jobs with the *Chicago Defender*

C) To demonstrate that the factors that motivated the start of the Great Migration were different for Black women than they were for Black men

D) To provide an overview of the employment challenges faced by Black women in the agricultural and domestic spheres in the southern United States

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4

CONTINUE ▶

8

"How lifelike are they?" Many computer animators prioritize this question as they strive to create ever more realistic environments and lighting. Generally, while characters in computer-animated films appear highly exaggerated, environments and lighting are carefully engineered to mimic reality. But some animators, such as Pixar's Sanjay Patel, are focused on a different question. Rather than asking first whether the environments and lighting they're creating are convincingly lifelike, Patel and others are asking whether these elements reflect their films' unique stories.

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

A) It reflects a primary goal that many computer animators have for certain components of the animations they produce.

B) It represents a concern of computer animators who are more interested in creating unique backgrounds and lighting effects than realistic ones.

C) It conveys the uncertainty among many computer animators about how to create realistic animations using current technology.

D) It illustrates a reaction that audiences typically have to the appearance of characters created by computer animators.

9

The field of study called affective neuroscience seeks instinctive, physiological causes for feelings such as pleasure or displeasure. Because these sensations are linked to a chemical component (for example, the release of the neurotransmitter dopamine in the brain when one receives or expects a reward), they can be said to have a partly physiological basis. These processes have been described in mammals, but Jingnan Huang and his colleagues have recently observed that some behaviors of honeybees (such as foraging) are also motivated by a dopamine-based signaling process.

What choice best describes the main purpose of the text?

A) It describes an experimental method of measuring the strength of physiological responses in humans.

B) It illustrates processes by which certain insects can express how they are feeling.

C) It summarizes a finding suggesting that some mechanisms in the brains of certain insects resemble mechanisms in mammalian brains.

D) It presents research showing that certain insects and mammals behave similarly when there is a possibility of a reward for their actions.

10

In 2019, 20 previously unknown moons were confirmed to be orbiting Saturn. Three of the moons have prograde orbits (orbiting in the direction the planet spins), and the other 17 have retrograde orbits (orbiting in the opposite direction of the planet's spin). All but one of the 20 moons are thought to be remnants of bodies that orbited Saturn until they broke apart in collisions. Although the one exceptional moon orbits in the same direction as the planet's spin, its orbit is highly eccentric compared to the rest, which may suggest that it has a different origin than the other 19 moons.

Based on the text, which choice best describes the moon with the eccentric orbit?

A) It doesn't have a retrograde orbit, but it likely has the same origin as the moons with retrograde orbits.

B) Its orbit is so tilted with respect to the other moons' orbits that it's neither prograde nor retrograde.

C) It has a prograde orbit that is likely the result of having collided with another body orbiting Saturn.

D) It has a prograde orbit and may not be a remnant of an earlier body that orbited Saturn.

11

Several scholars have argued that conditions in England in the late ninth through early eleventh centuries—namely, burgeoning literacy amid running conflicts between England's Anglo-Saxon kingdoms and Danish invaders—were especially conducive to the production of the Old English epic poem *Beowulf*, and they have dated the poem's composition accordingly. It is not inconceivable that *Beowulf* emerged from such a context, but privileging contextual fit over the linguistic evidence of an eighth- or even seventh-century composition requires a level of justification that thus far has not been presented.

Which choice best states the main idea of the text?

A) Although there are some grounds for believing that *Beowulf* was composed between the late ninth and early eleventh centuries, advocates for that view tend to rely on evidence that has been called into question by advocates for an earlier date.

B) Although several scholars have dated *Beowulf* to the late ninth through early eleventh centuries, others have argued that doing so privileges a controversial interpretation of the social conditions of the period.

C) Although *Beowulf* fits well with the historical context of England in the late ninth through early eleventh centuries, it fits equally well with the historical context of England in the seventh and eighth centuries.

D) Although the claim of a late ninth- through early eleventh-century composition date for *Beowulf* has some plausibility, advocates for the claim have not compellingly addressed evidence suggesting an earlier date.

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6

CONTINUE

12

E-book Sales as a Percentage of Total Unit Sales in All Book Formats for a Large US Trade Publisher, by Genre, 2006, 2011, 2016

Genre	2006	2011	2016
science fiction and fantasy	0.6	27.7	36.7
cookbooks	0	2.9	10.5
travel guides	0	5.5	24.6
romance	0.3	40.6	56.2

E-books became an increasingly popular means of reading in the United States in the 2000s and 2010s, though that popularity was concentrated in titles that, like those in most fiction genres, are meant to be read straight through from beginning to end. For books in nonfiction genres that do not tell stories and require the reader to flip back and forth through a volume, e-books were significantly less commercially successful. This can be seen by comparing _____

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

A) the percentage of 2016 cookbook sales that were e-books with the percentage of 2016 science fiction and fantasy sales that were e-books.

B) the percentage of 2006 romance sales that were e-books with the percentage of 2016 romance sales that were e-books.

C) the percentage of 2006 romance sales that were e-books with the 2006 science fiction and fantasy sales that were e-books.

D) the percentage of 2011 travel guide sales that were e-books with the percentage of 2016 travel guide sales that were e-books.

13

Although most songbirds build open, cupped nests, some species build domed nests with roofs that provide much more protection. Many ecologists have assumed that domed nests would provide protection from weather conditions and thus would allow species that build them to have larger geographic ranges than species that build open nests do. To evaluate this assumption, a research team led by evolutionary biologist Iliana Medina analyzed data for over 3,000 species of songbirds.

Which finding from Medina and her colleagues' study, if true, would most directly challenge the assumption in the underlined sentence?

A) Species that build open nests tend to have higher extinction rates than species that build domed nests.

B) Species that build open nests tend to be smaller in size than species that build domed nests.

C) Species that build open nests tend to use fewer materials to build their nests than species that build domed nests do.

D) Species that build open nests tend to have larger ranges than species that build domed nests.

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7

CONTINUE

14

A student is writing a paper about *One Night in Miami...*, a 2020 film directed by Regina King and written by Kemp Powers. Powers adapted the film's screenplay from his 2013 play, which he wrote after learning about a 1964 meeting that took place in Miami, Florida, between four prominent figures of the Civil Rights movement: Malcolm X, Muhammad Ali, Jim Brown, and Sam Cooke. The student claims that although Powers was inspired by this meeting, the film is best understood not as a precise retelling of historical events but rather as a largely imagined but informed representation of them.

Which quotation from an article about *One Night in Miami...* would be the most effective evidence for the student to include in support of this claim?

A) "When Powers learned of the meeting, he initially planned to write a much longer work about its four famous participants rather than focusing on the meeting itself."

B) "*One Night in Miami...* received numerous awards and nominations, including an Academy Award nomination for Powers for Best Adapted Screenplay."

C) "Powers has described *One Night in Miami...* as the story of four friends encouraging and supporting one another while engaged in a crucial political debate about how best to achieve equality for Black people in the United States."

D) "Powers could find only the most superficial historical details about the meeting, so he read extensively about the four individuals and their thinking at the time in an effort to portray what might have happened between them."

15

When the Vinland Map, a map of the world purported to date to the mid-1400s, surfaced in 1957, some scholars believed it demonstrated that European knowledge of the eastern coast of present-day North America predated Christopher Columbus's 1492 arrival. In 2021, a team including conservators Marie-France Lemay and Paula Zyats and materials scientist Anikó Bezur performed an extensive analysis of the map and the ink used. They found that the ink contains titanium dioxide, a compound that was first introduced in ink manufacturing in the early 1900s. Therefore, the team concluded that _____

Which choice most logically completes the text?

A) mid-1400s Europeans could not have known about the eastern coast of present-day North America.

B) the Vinland Map could not have been drawn by mid-1400s mapmakers.

C) mapmakers must have used titanium compounds in their ink in the 1400s.

D) there isn't enough information to determine when the ink was created.

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8

CONTINUE

16

Aerogels are highly porous foams consisting mainly of tiny air pockets within a solidified gel. These lightweight materials are often applied to spacecraft and other equipment required to withstand extreme conditions, as they provide excellent insulation despite typically being brittle and eventually fracturing due to degradation from repeated exposure to high heat. Now, Xiangfeng Duan of the University of California, Los Angeles, and colleagues have developed an aerogel with uniquely flexible properties. Unlike earlier aerogels, Duan's team's material contracts rather than expands when heated and fully recovers after compressing to just 5% of its original volume, suggesting that _____

Which choice most logically completes the text?

A) the aerogel's remarkable flexibility results from its higher proportion of air pockets to solidified gel as compared to other aerogels.

B) the aerogel's overall strength is greater than that of other insulators but its ability to withstand exposure to intense heat is lower.

C) the aerogel will be more effective as an insulator for uses that involve gradual temperature shifts than for those that involve rapid heat increases.

D) the aerogel will be less prone to the structural weakness that ultimately causes most other aerogels to break down with use.

17

Some *Astyanax mexicanus*, a river-dwelling fish found in northeast Mexico, have colonized caves in the region. Although there is little genetic difference between river and cave *A. mexicanus* and all members of the species can emit the same sounds, biologist Carole Hyacinthe and colleagues found that the context and significance of those sounds vary by location—e.g., the click that river-dwelling *A. mexicanus* use to signal aggression is used by cave dwellers when foraging—and the acoustic properties of cave fish sounds show some cave-specific variations as well. Hyacinthe and colleagues note that differences in sonic communication could accumulate to the point of inhibiting interbreeding among fish from different locations, suggesting that _____

Which choice most logically completes the text?

A) although *A. mexicanus* living in rivers are genetically similar to those living in caves, river fish rely on sonic communication less than cave fish do.

B) although *A. mexicanus* is a single species at present, it could be in the process of splitting into distinct populations with different characteristics.

C) although all *A. mexicanus* emit sounds, the fish living in rivers produce some sounds that the fish living in caves do not, and vice versa.

D) although *A. mexicanus* from different locations can interbreed currently, river fish and cave fish are sufficiently genetically distinct that they can be considered separate species.

18

Geoglyphs are large-scale designs of lines or shapes created in a natural landscape. The Nazca Lines were created in the Nazca Desert in Peru by several Indigenous civilizations over a period of many centuries. Peruvian archaeologist Johny Isla specializes in these geoglyphs. At a German exhibit about the Nazca Lines, he saw an old photograph of a large geoglyph of a whalelike figure and was surprised that he didn't recognize it. Isla returned to Peru and used a drone to search a wide area, looking for the figure from the air. This approach suggests that Isla thought that if he hadn't already seen it, the whalelike geoglyph _____

Which choice most logically completes the text?

A) must represent a species of whale that went extinct before there were any people in Peru.

B) is actually located in Germany, not Peru, and isn't part of the Nazca Lines at all.

C) is probably in a location Isla hadn't ever come across while on the ground.

D) was almost certainly created a long time after the other Nazca Lines geoglyphs were created.

19

The sun never sets during the Arctic summer in the Far North. In response, reindeer in this region must change their sleep habits. Instead of resting when it gets dark, they rest when they need _____ their food.

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

A) digest

B) will digest

C) to digest

D) digesting

20

Richard Spikes was a prolific African American inventor known for his contributions to automotive engineering. Between 1907 and 1946, he patented many inventions, _____ an automobile turn signal, a safety brake, and—most famously—the first automatic gearshift.

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

A) included

B) includes

C) including

D) will include

21

The radiation that _____ during the decay of radioactive atomic nuclei is known as gamma radiation.

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

A) occurs

B) have occurred

C) occur

D) are occurring

22

In 1903, environmentalist John Muir guided President Theodore Roosevelt on a scenic, sprawling trip through California's Yosemite Valley. Upon returning from the three-day excursion, Roosevelt _____ to conserve the nation's wilderness areas, a vow he upheld for his remaining six years in office.

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

A) is vowing

B) vowed

C) will vow

D) vows

23

Polyphenols are organic compounds _____ among their many roles, provide pigment that helps protect plants against ultraviolet radiation from sunlight.

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

A) that—

B) that;

C) that,

D) that:

24

In the early twentieth century, Joseph Kekuku and other Hawaiian _____ in the mainland United States to the bright and lilting sound of the *kīkā kila*, or Hawaiian steel guitar. The instrument soon became a fixture in American blues and country music.

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

A) musicians introduced audiences

B) musicians' introduced audiences'

C) musician's introduced audience's

D) musicians' introduced audiences

25

Award-winning cinematographer James Wong Howe was known for his innovative filming techniques. While filming a boxing match for the movie *Body and Soul* _____ Howe had a handheld camera operator wear roller skates. This allowed the operator to move smoothly around actors in a boxing ring, creating an immersive experience for viewers.

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

A) (1947), and

B) (1947),

C) (1947) and

D) (1947)

26

During the American Civil War, Thomas Morris Chester braved the front lines as a war correspondent for the *Philadelphia Press*. Amplifying the voices and experiences of Black soldiers _____ of particular importance to Chester, who later became an activist and lawyer during the postwar Reconstruction period.

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

A) were

B) have been

C) are

D) was

CONTINUE

27

Laetitia Ky's hair is her art. Inspired by hairstyles from various African tribes, the Ivorian artist uses wire and thread to sculpt her hair into all kinds of shapes. _____ she once made her hair into the shape of the continent of Africa—including the island of Madagascar!

Which choice completes the text with the most logical transition?

A) Soon,

B) Elsewhere,

C) For example,

D) However,

28

In 1885, Chinese-born California resident Mary Tape became a hero of the Asian American civil rights movement. In January of that year, she won an antidiscrimination case in the California Supreme Court. _____ in April, she wrote an open letter criticizing her local board of education for discrimination. Both actions are remembered today as historic stands against racism.

Which choice completes the text with the most logical transition?

A) Later,

B) For instance,

C) In other words,

D) Rather,

29

Phytoplankton play a crucial role in the ocean's uptake of carbon from the atmosphere. When alive, these tiny marine organisms absorb atmospheric carbon via photosynthesis. _____ after they die, the phytoplankton sink to the seafloor, where the carbon in their cells gets stored in sediment, preventing it from cycling back into the atmosphere.

Which choice completes the text with the most logical transition?

A) Specifically,

B) By contrast,

C) Nevertheless,

D) Then,

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CONTINUE

30

Originally coined by economist Joan Robinson to refer to markets with multiple sellers of a product but only one buyer, the term "monopsony" can also refer to markets where demand for labor is limited. In a product monopsony, the single buyer can force sellers to lower their prices. _____ in a labor monopsony, employers can force workers to accept lower wages.

Which choice completes the text with the most logical transition?

A) Earlier,

B) Instead,

C) Similarly,

D) In particular,

31

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

- J.R.R. Tolkien's 1937 novel *The Hobbit* features two maps.

- The novel opens with a reproduction of the map that the characters use on their quest.

- This map introduces readers to the fictional world they are about to enter.

- The novel closes with a map depicting every stop on the characters' journey.

- That map allows readers to reconstruct the story they have just read.

The student wants to contrast the purposes of the two maps in *The Hobbit*. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) *The Hobbit*'s opening map introduces readers to the fictional world they are about to enter, while the closing map allows them to reconstruct the story they have just read.

B) *The Hobbit*, a novel published by J.R.R. Tolkien in 1937, features a reproduction of a map that the characters use on their quest, as well as a map that appears at the end of the novel.

C) *The Hobbit*'s two maps, one opening and one closing the novel, each serve a purpose for readers.

D) In 1937, author J.R.R. Tolkien published *The Hobbit*, a novel featuring both an opening and a closing map.

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CONTINUE

32

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

- John Carver was one of the 41 signatories of the Mayflower Compact.

- The Mayflower Compact was a legal agreement among the pilgrims that immigrated to Plymouth Colony.

- It was created in 1620 to establish a common government.

- It states that the pilgrims who signed it wanted to "plant the first colony in the northern parts of Virginia" under King James.

- Carver became the first governor of Plymouth Colony.

The student wants to specify the reason the Mayflower Compact was created. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) Stating that its signatories wanted to "plant the first colony in the northern parts of Virginia," the Mayflower Compact was a legal agreement among the pilgrims that immigrated to Plymouth Colony.

B) Created in 1620, the Mayflower Compact states that the pilgrims wanted to "plant the first colony in the northern parts of Virginia."

C) The Mayflower Compact was created to establish a common government among the pilgrims that immigrated to Plymouth Colony.

D) The Mayflower Compact had 41 signatories, including John Carver, the first governor of Plymouth Colony.

33

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

- Cities tend to have a wide range of flowering vegetation in parks, yards, and gardens.

- This vegetation provides a varied diet for honeybees, strengthening bees' immune systems.

- On average, 62.5 percent of bees in an urban area will survive a harsh winter.

- Rural areas are often dominated by monoculture crops such as corn or wheat.

- On average, only 40 percent of honeybees in a rural area will survive a harsh winter.

The student wants to make and support a generalization about honeybees. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) Cities tend to have a wider range of flowering vegetation than do rural areas, which are often dominated by monoculture crops.

B) In urban areas, over 60 percent of honeybees, on average, will survive a harsh winter, whereas in rural areas, only 40 percent will.

C) The strength of honeybees' immune systems depends on what the bees eat, and a varied diet is more available to bees in an urban area than to those in a rural area.

D) Honeybees are more likely to thrive in cities than in rural areas because the varied diet available in urban areas strengthens the bees' immune systems.

STOP

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

Reading and Writing

33 QUESTIONS

1

Archaeologists studying an ancient amphitheater in Switzerland believe that it dates back to the fourth century CE. Their discoveries of a coin made between 337 and 341 CE and era-appropriate building materials _____ evidence for this theory.

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

A) dismiss

B) provide

C) regulate

D) refuse

2

The following text is adapted from Lewis Carroll's 1865 novel *Alice's Adventures in Wonderland*.

> "The second thing is to find my way into that lovely garden. I think that will be the best plan." It sounded like an excellent plan, no doubt, and very neatly and <u>simply</u> arranged; the only difficulty was, that Alice had not the smallest idea how to set about it.

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

A) Faintly

B) Hastily

C) Easily

D) Foolishly

3

Cucurbits, a group of plants that includes squash and melons, relied on mastodons to spread their seeds in the Ice Age. When these animals died out, cucurbits faced extinction in turn, having lost their means of seed dispersal. Around this time, however, the ancestors of Indigenous peoples in North America began raising cucurbits as crops, thus _____ the plants' survival.

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

A) verifying

B) multiplying

C) comforting

D) ensuring

4

The recent discovery of a carved wooden figure dating to around 2,000 years ago in a ditch in England was truly surprising. Wooden objects _____ survive for so long due to their high susceptibility to rot, but archaeologists suspect layers of sediment in the ditch preserved the figure by creating an oxygen-free environment.

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

A) sturdily

B) carelessly

C) rarely

D) simply

5

Bicycle sharing systems allow users to rent a bicycle at one location within a city and return it to any other designated location in that city, which can cause serious problems of bicycle supply and user demand within the city's system. Tohru Ikeguchi uses open-source data and statistical modeling to identify when a high number of users making one-way trips is likely to leave some locations within the system _____ bicycles and other areas with insufficient supply.

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

A) susceptible to

B) contingent on

C) saturated with

D) depleted of

6

When ancient oak planks were unearthed during subway construction in Rome, Mauro Bernabei and his team examined the growth rings in the wood to determine where these planks came from. By comparing the growth rings on the planks to records of similar rings in oaks from Europe, the team could trace the wood to the Jura region of France, hundreds of kilometers from Rome. Because timber could only have been transported from distant Jura to Rome by boat, the team's findings suggest the complexity of Roman trade routes.

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

A) It presents a conclusion about Roman trade routes based on the team's findings.

B) It questions how the team was able to conclude that the planks were used to build a boat.

C) It explains why the planks were made from oak rather than a different kind of wood.

D) It describes common methods used in Roman subway construction.

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CONTINUE

7

For his 1986 album *Keyboard Fantasies*, Beverly Glenn-Copeland wrote songs grounded in traditional soul and folk music, then accompanied them with futuristic synthesizer arrangements featuring ambient sounds and complex rhythms. The result was so strange, so unprecedented, that the album attracted little attention when first released. In recent years, however, a younger generation of musicians has embraced the stylistic experimentation of *Keyboard Fantasies*. Alternative R&B musicians Blood Orange and Moses Sumney, among other contemporary recording artists, cite the album as an influence.

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

A) It urges contemporary musicians to adopt the unique sound of *Keyboard Fantasies.*

B) It responds to criticism of *Keyboard Fantasies* by some younger musicians.

C) It offers examples of younger musicians whose work has been impacted by *Keyboard Fantasies.*

D) It contrasts *Keyboard Fantasies* with the recordings of two younger musicians.

8

A number of Indigenous politicians have been elected to the United States Congress since 2000 as members of the country's two established political parties. In Canada and several Latin American countries, on the other hand, Indigenous people have formed their own political parties to advance candidates who will advocate for the interests of their communities. This movement has been particularly successful in Ecuador, where Guadalupe Llori, a member of the Indigenous party known as Pachakutik, was elected president of the National Assembly in 2021.

Which choice best states the main purpose of the text?

A) To trace the history of an Indigenous political movement and speculate about its future development

B) To argue that Indigenous politicians in the United States should form their own political party

C) To highlight two approaches to achieving political representation for Indigenous people

D) To consider how Indigenous politicians in the United States have influenced Indigenous politicians in Canada and Latin America

CONTINUE

9

Text 1

In a study of the benefits of having free time, Marissa Sharif found that the reported sense of life satisfaction tended to plateau when participants had two hours of free time per day and actually began to fall when they had five hours of free time per day. After further research, Sharif concluded that this dip in life satisfaction mainly occurred when individuals spent all their free time unproductively, such as by watching TV or playing games.

Text 2

Psychologist James Maddux cautions against suggesting an ideal amount of free time. The human desire for both free time and productivity is universal, but Maddux asserts that individuals have unique needs for life satisfaction. Furthermore, he points out that there is no objective definition for what constitutes productivity; reading a book might be considered a productive activity by some, but idleness by others.

Based on the texts, how would Maddux (Text 2) most likely respond to the conclusion Sharif (Text 1) reached after her further research?

A) By acknowledging that free time is more likely to enhance life satisfaction when it is spent productively than when it is spent unproductively

B) By challenging the reasoning in Text 1, as it has not been proved that productivity commonly contributes to individuals' life satisfaction

C) By warning against making an overly broad assumption, as there is no clear consensus in distinguishing between productive and unproductive activities

D) By claiming that the specific activities named in Text 1 are actually examples of productive activities rather than unproductive ones

10

Xin Wang and colleagues have discovered the earliest known example of a flower bud in a 164-million-year-old plant fossil in China. The researchers have named the new species *Florigerminis jurassica.* They believe that the discovery pushes the emergence of flowering plants, or angiosperms, back to the Jurassic period, which occurred between 145 million and 201 million years ago.

According to the text, how old was the fossil that Wang and colleagues discovered?

A) 150 million years old

B) 145 million years old

C) 164 million years old

D) 201 million years old

11

Modern dog breeds are largely the result of 160 years of owners crossbreeding certain dogs in order to select for particular physical appearances. Owners often say that some breeds are also more likely than others to have particular personality traits—basset hounds are affectionate; boxers are easy to train—but Kathleen Morrill and colleagues found through a combination of owner surveys and DNA sequencing of 2,000 dogs that while physical traits are predictably heritable among purebred dogs, behavior varies widely among dogs of the same breed.

Which choice best states the main idea of the text?

A) Dog breeds would not exist without many years of human intervention in dogs' reproduction.

B) Research fails to confirm a commonly held belief about dog breeds and behavior.

C) The dog breeds most popular among owners have often changed over the past 160 years.

D) A study of dog breeds is notable for its usage of both opinion surveys and DNA sequencing.

12

Paleontologist Lucas E. Fiorelli and colleagues have reported the discovery at a mine in Brazil of several egg clutches, partially preserved single eggs, and egg shells from the Late Cretaceous period. The researchers have concluded that the area was once a nesting and breeding site for titanosaurs, a group of sauropod dinosaurs. The finding is significant given the previous lack of known nesting sites in northern regions of South America, which led many paleontologists to assume that titanosaurs migrated south to lay eggs.

What does the text most strongly suggest about the site discovered by the researchers?

A) It is the earliest known example of a titanosaur nesting and breeding site.

B) It was very difficult to excavate given that it was discovered in a mine.

C) It may have been occupied by other sauropods in addition to titanosaurs.

D) It is farther north than any other nesting site discovered in South America.

13

Attendance and Cost of Hosting
for Past Four US World's Fairs

World's fairs held in the US	Cost (in US dollars)	Number of visitors
Century 21 Exposition (1962)	$47 million	9.60 million
HemisFair '68	$156 million	6.40 million
1984 World's Fair	$350 million	7.35 million
Expo '74	$78 million	5.60 million

Huge international exhibitions known as world's fairs have been held since 1851, but the United States hasn't hosted one since 1984. Architecture expert Mina Chow argues that this is because some people think the events are too expensive and not popular enough. For example, the 1984 World's Fair cost $350 million and had only _____

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

A) 7.35 million visitors.

B) 9.60 million visitors.

C) 6.40 million visitors.

D) 5.60 million visitors.

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20

CONTINUE

14

Sample of Food Items from Gemini Mission Menus

Food item	Day	Meal
Sugar cookie cubes	1	B
Chicken and vegetables	2	B
Shrimp cocktail	4	C
Hot cocoa	3	A

To make sure they got the nutrition they needed while in space, the astronauts of NASA's Gemini missions were given menus for three meals a day (meals A, B, and C) on a four-day rotating schedule. Looking at the sample of food items from these menus, a student notes that on day 1, the menu included _____

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

A) shrimp cocktail for meal B.

B) hot cocoa for meal C.

C) sugar cookie cubes for meal B.

D) chicken and vegetables for meal A.

15

An Ideal Husband is an 1895 play by Oscar Wilde. In the play, which is a satire, Wilde suggests that a character named Lady Gertrude Chiltern is perceived as both extremely virtuous and unforgiving, as is evident when another character says _____

Which quotation from *An Ideal Husband* most effectively illustrates the claim?

A) "Lady Chiltern is a woman of the very highest principles, I am glad to say. I am a little too old now, myself, to trouble about setting a good example, but I always admire people who do."

B) "Do you know, [Lady Chiltern], I don't mind your talking morality a bit. Morality is simply the attitude we adopt towards people whom we personally dislike."

C) "[Lady Chiltern] does not know what weakness or temptation is. I am of clay like other men. She stands apart as good women do—pitiless in her perfection—cold and stern and without mercy."

D) "Lady Chiltern, you are a sensible woman, the most sensible woman in London, the most sensible woman I know."

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21

CONTINUE

16

Percentage of Available Eggs Eaten by Cane Toad Tadpoles

Amphibian species (common name)	Percentage of eggs eaten	Native to Australia	Produces bufadienolide
Little red tree frog	1%	yes	no
Cane toad	90%	no	yes
Short-footed frog	7%	yes	no
Striped burrowing frog	10%	yes	no
Dainty green tree frog	1%	yes	no

Native to Latin America, the cane toad was introduced to Australia in the 1930s. In recent decades, tadpoles in the Australian population have been shown to consume eggs of their own species. A 2022 study showed that when presented with cane toad eggs as well as eggs of native Australian amphibians, cane toad tadpoles disproportionately consumed eggs of their own species. This behavior results from their attraction to bufadienolide, a chemical produced by the eggs of cane toads but not by the eggs of native amphibians. However, using data from this study, a student wishes to argue that the presence of bufadienolide doesn't entirely explain the cane toad tadpoles' preference for certain eggs over others.

Which choice best describes data from the table that support the student's argument?

A) The tadpoles consumed a higher percentage of the striped burrowing frog eggs than they did of the eggs of the dainty green tree frog.

B) The tadpoles left a certain percentage of the eggs of each of the five species unharmed, thus ultimately allowing them to hatch.

C) The tadpoles consumed a lower percentage of the short-footed frog eggs than they did of the eggs of their own species.

D) The tadpoles consumed the same percentage of the dainty green tree frog eggs as they did of the little red tree frog eggs.

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22

CONTINUE

17

The Intertropical Convergence Zone (ITCZ), a band of clouds that encircles Earth in the tropics and is a major rainfall source, shifts position in response to temperature variations across Earth's hemispheres. Data from Huagapo Cave in Peru suggest the ITCZ shifted south during the Little Ice Age (circa 1300–1850), but a shift as far into South America as Huagapo should have led to dry conditions in Central America, which is inconsistent with climate models. To resolve the issue, geologist Yemane Asmerom and colleagues collected data from Yok Balum Cave in Central America and compared them with the Huagapo data. They concluded that during the Little Ice Age, the ITCZ may have expanded northward and southward rather than simply shifted.

Which finding from Asmerom and colleagues' study, if true, would most directly support their conclusion?

A) Neither the Yok Balum data nor the Huagapo data show significant local variations in temperature during the Little Ice Age.

B) Both the Yok Balum data and the Huagapo data show increased temperatures and prolonged dry conditions during the Little Ice Age.

C) The Yok Balum data show prolonged dry conditions during the same portions of the Little Ice Age in which the Huagapo data show heightened levels of rainfall.

D) The Yok Balum data and the Huagapo data show strongly correlated patterns of high rainfall during the Little Ice Age.

18

Some businesses believe that when employees are interrupted while doing their work, they experience a decrease in energy and productivity. However, a team led by Harshad Puranik, who studies management, has found that interruptions by colleagues can have a social component that increases employees' sense of belonging, resulting in greater job satisfaction that benefits employees and employers. Therefore, businesses should recognize that _____

Which choice most logically completes the text?

A) the interpersonal benefits of some interruptions in the workplace may offset the perceived negative effects.

B) in order to maximize productivity, employers should be willing to interrupt employees frequently throughout the day.

C) most employees avoid interrupting colleagues because they don't appreciate being interrupted themselves.

D) in order to cultivate an ideal workplace environment, interruptions of work should be discouraged.

19

The US Geological Survey wants to map every human-made structure in the United States, and it is asking volunteers to help. Cassie Tammy Wang and Ashish D'Souza are just two of the many volunteer map editors who _____ to the project since it began in 2012.

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

A) contribute

B) will contribute

C) have contributed

D) will be contributing

20

Smaller than poppy seeds, tardigrades are tiny, but they are tough. These minuscule animals can survive for thirty years without food or water, and _____ can withstand extreme temperatures as low as minus 328 degrees and as high as 304 degrees Fahrenheit.

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

A) that

B) it

C) they

D) he

21

Emperor penguins don't waddle out of the ocean. They launch themselves at such a high speed that they travel up to two meters before landing. How _____ A layer of microbubbles on their plumage reduces friction as the penguins speed to the surface.

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

A) they are able to move so fast!

B) are they able to move so fast.

C) they are able to move so fast.

D) are they able to move so fast?

22

Before the Erie Canal was completed in 1825, transporting goods by wagon between New York City and the Midwest took up to forty-five days and cost one hundred dollars per ton. By linking the Hudson River to Lake _____ canal reduced transport time to nine days and cut costs to six dollars per ton.

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

A) Erie; the

B) Erie (the

C) Erie, the

D) Erie: the

23

Generations of mystery and horror _____ have been influenced by the dark, gothic stories of celebrated American author Edgar Allan Poe (1809–1849).

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

A) writers

B) writers,

C) writers—

D) writers;

CONTINUE

24

Midway through her 1968 jazz album *A Monastic Trio*, Alice Coltrane switches instruments, swapping the piano for the harp. With the same fluid style that Coltrane was famous for on piano, she _____ her fingers across the harp strings and creates a radiant sound.

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

A) sweep

B) are sweeping

C) were sweeping

D) sweeps

25

Mathematician and meteorologist Edward Lorenz used the metaphor of the "butterfly effect" to explain how seemingly minor events can have major impacts on future weather. According to Lorenz's metaphor, the wind from a butterfly flapping _____ in Brazil might eventually grow into a storm elsewhere across the globe.

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

A) its wings

B) its wings'

C) it's wing's

D) it's wings'

26

On sunny days, dark rooftops absorb solar energy and convert it to unwanted heat, raising the surrounding air _____ a light-colored covering to an existing dark roof, either by attaching prefabricated reflective sheets or spraying on a paint-like coating, helps combat this effect.

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

A) temperature; by adding

B) temperature, adding

C) temperature. Adding

D) temperature by adding

27

The haiku-like poems of Tomas Tranströmer, which present nature- and dream-influenced images in crisp, spare language, have earned the Swedish poet praise from leading contemporary _____ them Nigerian American essayist and novelist Teju Cole, who has written that Tranströmer's works "contain a luminous simplicity."

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

A) writers. Among

B) writers among

C) writers; among

D) writers, among

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25

CONTINUE

28

In studying whether jellyfish sleep, researchers Michael Abrams, Claire Bedbrook, and Ravi Nath attempted to answer three questions. _____ is there a period each day when the pulse rates of jellyfish decline? Second, do jellyfish respond more slowly to stimuli during that period? Finally, if prevented from sleeping, are jellyfish adversely affected?

Which choice completes the text with the most logical transition?

A) As a result,

B) First,

C) Additionally,

D) However,

29

With her room-sized installation *The Interstitium*, Iranian American artist Laleh Mehran succeeded in creating a space that felt, as intended, both "familiar and distant." _____ with a video screen placed at the far end of the coal slag-encrusted room, her installation was reminiscent of a typical movie theater—albeit one found in a subterranean coal mine.

Which choice completes the text with the most logical transition?

A) Next,

B) Nevertheless,

C) Indeed,

D) Instead,

30

In response to adverse environmental conditions, many plants produce abscisic acid (ABA), a stress hormone. ABA triggers a slowdown in the biological processes of most plants. _____ when the mustard plant *Schrenkiella parvula* produces ABA in response to an environmental stressor, the hormone triggers accelerated growth.

Which choice completes the text with the most logical transition?

A) Moreover,

B) In contrast,

C) For example,

D) Thus,

31

Historically, most conductors of major orchestras and opera companies have been European men, but a new, more diverse generation of artists is stepping up to the podium. Mexico's Alondra de la Parra took over as conductor for the Queensland Symphony Orchestra in 2017, _____ and Colombia's Lina Gonzalez-Granados did the same for the Los Angeles Opera in 2022.

Which choice completes the text with the most logical transition?

A) in addition,

B) lastly,

C) granted,

D) for instance,

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26

CONTINUE ▶

32

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

- Planetary scientists classify asteroids based on their composition.

- C-type asteroids are composed primarily of carbon.

- They account for roughly 75 percent of known asteroids.

- S-type asteroids are primarily made up of silicate minerals.

- They account for roughly 17 percent of known asteroids.

The student wants to emphasize a difference between C-type and S-type asteroids. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) Planetary scientists classify asteroids into types, two of which are the C-type and the S-type.

B) Planetary scientists consider an asteroid's composition (such as whether the asteroid is composed mainly of silicate minerals or carbon) when classifying it.

C) Roughly 17 percent of known asteroids are classified as S-type asteroids; another percentage is classified as C-type asteroids.

D) C-type asteroids are mainly composed of carbon, whereas S-type asteroids are primarily made up of silicate minerals.

33

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

- A commodity chain is the series of links connecting the production and purchase of a commodity on the world market.

- Chinese American anthropologist Anna Tsing studies the contemporary commodity chain of matsutake mushrooms.

- At one end of the matsutake chain are mushroom pickers in Oregon.

- At the other end are wealthy consumers who buy the costly matsutake in Japan.

- According to Tsing, "Japanese traders began importing matsutake in the 1980s, when the scarcity of matsutake in Japan first became clear."

The student wants to provide an overview of the matsutake commodity chain. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) The contemporary matsutake commodity chain has its origins in the 1980s when, according to Tsing, "the scarcity of matsutake in Japan first became clear."

B) Commodity chains include the linked production and purchase of commodities, such as the matsutake mushroom, on the world market.

C) Decades after the Japanese import of matsutake began, a commodity chain now links matsutake pickers in Oregon with wealthy consumers of the costly mushrooms in Japan.

D) Wealthy consumers who buy the costly mushrooms in Japan are at one end of the matsutake commodity chain.

STOP

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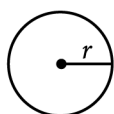
Math
27 QUESTIONS

DIRECTIONS

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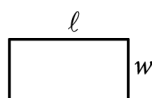
NOTES

Unless otherwise indicated:

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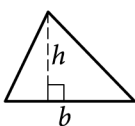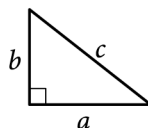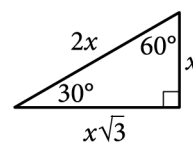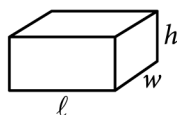
REFERENCE

$A = \pi r^2$
$C = 2\pi r$

$A = \ell w$
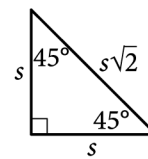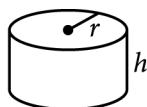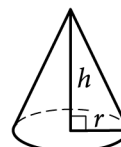
$A = \dfrac{1}{2}bh$

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

Special Right Triangles

$V = \ell wh$

$V = \pi r^2 h$

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

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

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

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

The number of radians of arc in a circle is 2π.

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

CONTINUE

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.

For student-produced response questions, solve each problem and write your answer next to or under the question in the test book as described below.

- Once you've written your answer, circle it clearly. You will not receive credit for anything written outside the circle, or for any questions with more than one circled answer.

- If you find **more than one correct answer**, write and circle only one answer.

- Your answer can be up to 5 characters for a **positive** answer and up to 6 characters (including the negative sign) for a **negative** answer, but no more.

- If your answer is a **fraction** that is too long (over 5 characters for positive, 6 characters for negative), write the decimal equivalent.

- If your answer is a **decimal** that is too long (over 5 characters for positive, 6 characters for negative), truncate it or round at the fourth digit.

- If your answer is a **mixed number** (such as $3\frac{1}{2}$), write it as an improper fraction (7/2) or its decimal equivalent (3.5).

- Don't include **symbols** such as a percent sign, comma, or dollar sign in your circled answer.

1

How many <u>teaspoons</u> are equivalent to
44 tablespoons? (3 teaspoons = 1 tablespoon)

A) 47

B) 88

C) 132

D) 176

2

The function f is defined by $f(x) = \dfrac{1}{6x}$. What is the

value of $f(x)$ when $x = 3$?

A) $\dfrac{1}{3}$

B) $\dfrac{1}{6}$

C) $\dfrac{1}{9}$

D) $\dfrac{1}{18}$

3

If $x = 40$, what is the value of $x + 6$?

A) 34

B) 40

C) 46

D) 64

4

What is 23% of 100?

A) 23

B) 46

C) 77

D) 123

5

Which expression is equivalent to $50x^2 + 5x^2$?

A) $250x^2$

B) $10x^2$

C) $45x^2$

D) $55x^2$

6

The population density of Cedar County is
230 people per square mile. The county has a
population of 85,100 people. What is the area, in
square miles, of Cedar County?

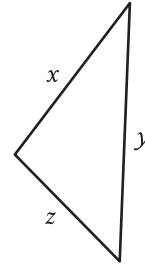**CONTINUE**

7

$$\frac{-54}{w} = 6$$

What is the solution to the given equation?

8

For the function f, the graph of $y = f(x)$ in the xy-plane has a slope of 3 and passes through the point $(0, -8)$. Which equation defines f ?

A) $f(x) = 3x$

B) $f(x) = 3x - 8$

C) $f(x) = 3x + 5$

D) $f(x) = 3x + 11$

9

Note: Figure not drawn to scale.

The triangle shown has a perimeter of 22 units. If $x = 9$ units and $y = 7$ units, what is the value of z, in units?
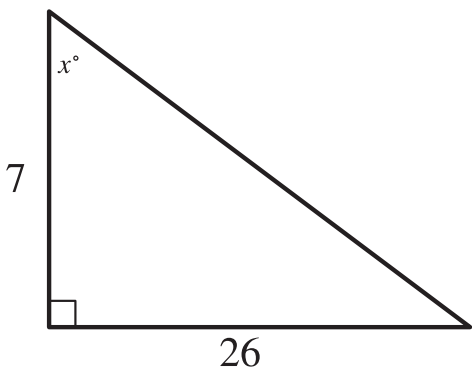
A) 6

B) 7

C) 9

D) 16

10

The function h is defined by $h(x) = 3x - 7$. What is the value of $h(-2)$?

A) -13

B) -10

C) 10

D) 13

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31

CONTINUE ▶

11

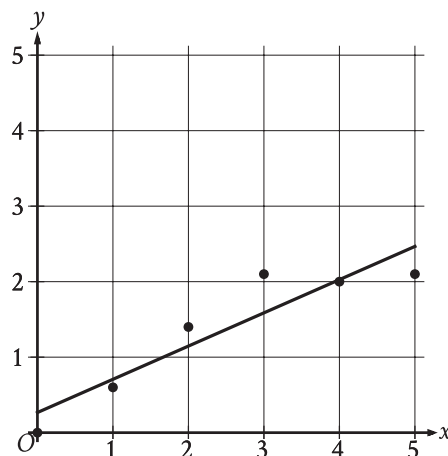Note: Figure not drawn to scale.

In the triangle shown, what is the value of $\tan x°$?

A) $\dfrac{1}{26}$

B) $\dfrac{19}{26}$

C) $\dfrac{26}{7}$

D) $\dfrac{33}{7}$

12

The scatterplot shows the relationship between x and y. A line of best fit is also shown.

Which of the following is closest to the slope of the line of best fit shown?

A) −2.27

B) −0.44

C) 0.44

D) 2.27

CONTINUE

13

The *y*-intercept of the graph of $12x + 2y = 18$ in the *xy*-plane is $(0, y)$. What is the value of *y* ?

14

A model predicts that a certain animal weighed 241 pounds when it was born and that the animal gained 3 pounds per day in its first year of life. This model is defined by an equation in the form $f(x) = a + bx$, where $f(x)$ is the predicted weight, in pounds, of the animal x days after it was born, and a and b are constants. What is the value of a ?

15
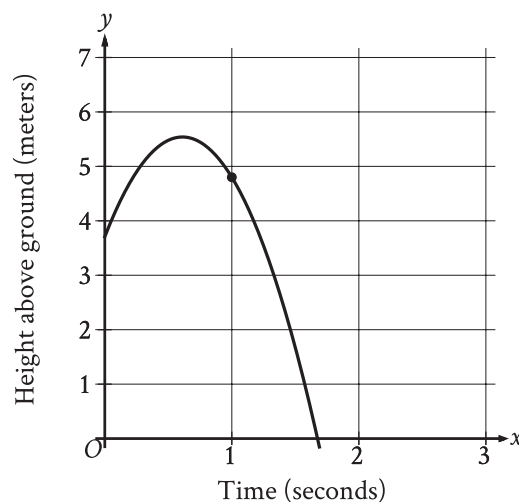
The graph shows the height above ground, in meters, of a ball x seconds after the ball was launched upward from a platform. Which statement is the best interpretation of the marked point $(1.0, 4.8)$ in this context?

A) 1.0 second after being launched, the ball's height above ground is 4.8 meters.

B) 4.8 seconds after being launched, the ball's height above ground is 1.0 meter.

C) The ball was launched from an initial height of 1.0 meter with an initial velocity of 4.8 meters per second.

D) The ball was launched from an initial height of 4.8 meters with an initial velocity of 1.0 meter per second.

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CONTINUE ▶

16

Based on a random sample from a population, a researcher estimated that the mean value of a certain variable for the population is 20.5, with an associated margin of error of 1. Which of the following is the most appropriate conclusion?

A) It is plausible that the actual mean value of the variable for the population is between 19.5 and 21.5.

B) It is not possible that the mean value of the variable for the population is less than 19.5 or greater than 21.5.

C) Every value of the variable in the population is between 19.5 and 21.5.

D) The mean value of the variable for the population is 20.5.

17

$$7m = 5(n + p)$$

The given equation relates the positive numbers m, n, and p. Which equation correctly gives n in terms of m and p ?

A) $n = \dfrac{5p}{7m}$

B) $n = \dfrac{7m}{5} - p$

C) $n = 5(7m) + p$

D) $n = 7m - 5 - p$

18

A rectangle has a length that is 15 times its width. The function $y = (15w)(w)$ represents this situation, where y is the area, in square feet, of the rectangle and $y > 0$. Which of the following is the best interpretation of $15w$ in this context?

A) The length of the rectangle, in feet

B) The area of the rectangle, in square feet

C) The difference between the length and the width of the rectangle, in feet

D) The width of the rectangle, in feet

19

$$x + 2y = 6$$
$$x - 2y = 4$$

The solution to the given system of equations is (x, y). What is the value of x ?

A) 2.5

B) 5

C) 6

D) 10

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34

CONTINUE

20

The table shows the frequency of values in a data set.

Value	Frequency
19	7
21	1
23	7
25	4

What is the minimum value of the data set?

21

A number x is at most 17 less than 5 times the value of y. If the value of y is 3, what is the greatest possible value of x ?

22
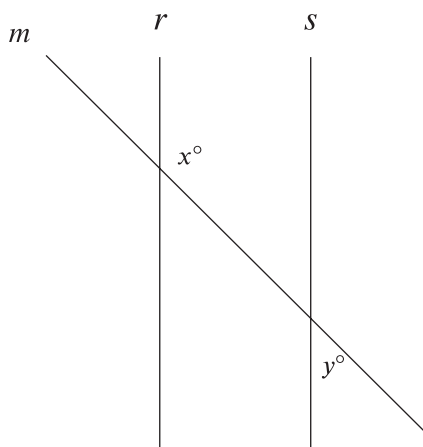
$$5x^2 - 37x - 24 = 0$$

What is the positive solution to the given equation?

A) $\dfrac{3}{5}$

B) 3

C) 8

D) 37

23

Note: Figure not drawn to scale.

In the figure shown, lines r and s are parallel, and line m intersects both lines. If $y < 65$, which of the following must be true?

A) $x < 115$

B) $x > 115$

C) $x + y < 180$

D) $x + y > 180$

24

$$f(x) = \frac{a - 19}{x} + 5$$

In the given function f, a is a constant. The graph of function f in the xy-plane, where $y = f(x)$, is translated 3 units down and 4 units to the right to produce the graph of $y = g(x)$. Which equation defines function g ?

A) $g(x) = \dfrac{a - 19}{x + 4} + 2$

B) $g(x) = \dfrac{a - 19}{x - 4} + 2$

C) $g(x) = \dfrac{a - 22}{x + 4} + 5$

D) $g(x) = \dfrac{a - 22}{x - 4} + 5$

25

A machine launches a softball from ground level. The softball reaches a maximum height of 51.84 meters above the ground at 1.8 seconds and hits the ground at 3.6 seconds. Which equation represents the height above ground h, in meters, of the softball t seconds after it is launched?

A) $h = -t^2 + 3.6$

B) $h = -t^2 + 51.84$

C) $h = -16(t - 1.8)^2 - 3.6$

D) $h = -16(t - 1.8)^2 + 51.84$

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36

CONTINUE

26

In triangle ABC, the measure of angle B is 90° and $\overline{BD}$ is an altitude of the triangle. The length of $\overline{AB}$ is 15 and the length of $\overline{AC}$ is 23 greater than the length of $\overline{AB}$. What is the value of $\dfrac{BC}{BD}$?

A) $\dfrac{15}{38}$

B) $\dfrac{15}{23}$

C) $\dfrac{23}{15}$

D) $\dfrac{38}{15}$

27

$$f(x) = (x + 7)^2 + 4$$

The function f is defined by the given equation. For what value of x does $f(x)$ reach its minimum?

STOP

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

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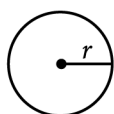
37

Math

27 QUESTIONS

DIRECTIONS

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

NOTES

Unless otherwise indicated:

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

REFERENCE

$A = \pi r^2$
$C = 2\pi r$

$A = \ell w$

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

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

Special Right Triangles

$V = \ell w h$

$V = \pi r^2 h$

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

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

$V = \frac{1}{3}\ell w h$

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

The number of radians of arc in a circle is 2π.

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

CONTINUE

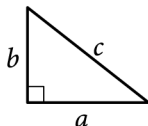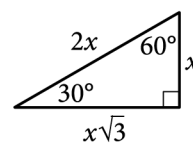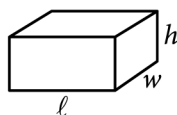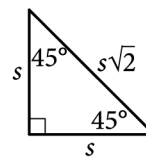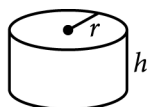**For multiple-choice questions**, solve each problem, choose the correct answer from the choices provided, and then circle your answer in this book. Circle only one answer for each question. If you change your mind, completely erase the circle. You will not get credit for questions with more than one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

For student-produced response questions, solve each problem and write your answer next to or under the question in the test book as described below.

- Once you've written your answer, circle it clearly. You will not receive credit for anything written outside the circle, or for any questions with more than one circled answer.

- If you find **more than one correct answer**, write and circle only one answer.

- Your answer can be up to 5 characters for a **positive** answer and up to 6 characters (including the negative sign) for a **negative** answer, but no more.

- If your answer is a **fraction** that is too long (over 5 characters for positive, 6 characters for negative), write the decimal equivalent.

- If your answer is a **decimal** that is too long (over 5 characters for positive, 6 characters for negative), truncate it or round at the fourth digit.

- If your answer is a **mixed number** (such as $3\frac{1}{2}$), write it as an improper fraction (7/2) or its decimal equivalent (3.5).

- Don't include **symbols** such as a percent sign, comma, or dollar sign in your circled answer.

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39

CONTINUE

1

The box plot summarizes 15 data values. What is the median of this data set?

A) 2

B) 3

C) 5

D) 8

2
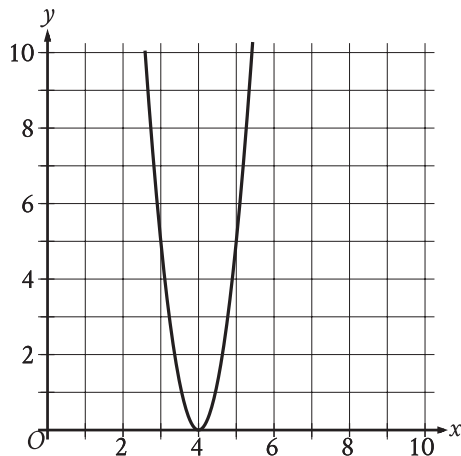
What is the x-intercept of the graph shown?

A) $(-5, 0)$

B) $(5, 0)$

C) $(-4, 0)$

D) $(4, 0)$

3

Henry receives a $60.00 gift card to pay for movies online. He uses his gift card to buy 3 movies for $7.50 each. If he spends the rest of his gift card balance on renting movies for $1.50 each, how many movies can Henry rent?

A) 10

B) 25

C) 35

D) 40

4

$$x = 49$$
$$y = \sqrt{x} + 9$$

The graphs of the given equations intersect at the point (x, y) in the xy-plane. What is the value of y ?

A) 16

B) 40

C) 81

D) 130

5

A cherry pitting machine pits 12 pounds of cherries in 3 minutes. At this rate, how many minutes does it take the machine to pit 96 pounds of cherries?

A) 8

B) 15

C) 24

D) 36

6

If $2x = 12$, what is the value of $9x$?

7

Line k is defined by $y = \dfrac{1}{4}x + 1$. Line j is parallel to

line k in the xy-plane. What is the slope of j ?

8

6, 6, 8, 8, 8, 10, 21

Which of the following lists represents a data set that has the same median as the data set shown?

A) 4, 6, 6, 6, 8, 8

B) 6, 6, 8, 8, 10, 10

C) 6, 8, 10, 10, 10, 12

D) 8, 8, 10, 10, 21, 21

9

The length of the base of a certain parallelogram is 89% of the height of the parallelogram. Which expression represents the length of the base of the parallelogram, where h is the height of the parallelogram?

A) $89h$

B) $0.089h$

C) $8.9h$

D) $0.89h$

10

For a camping trip a group bought x one-liter bottles of water and y three-liter bottles of water, for a total of 240 liters of water. Which equation represents this situation?

A) $x + 3y = 240$

B) $x + y = 240$

C) $3x + 3y = 240$

D) $3x + y = 240$

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CONTINUE

11

$$y = -4x + 40$$

Which table gives three values of x and their corresponding values of y for the given equation?

A)

x	y
0	0
1	−4
2	−8

B)

x	y
0	40
1	44
2	48

C)

x	y
0	40
1	36
2	32

D)

x	y
0	0
1	4
2	8

12
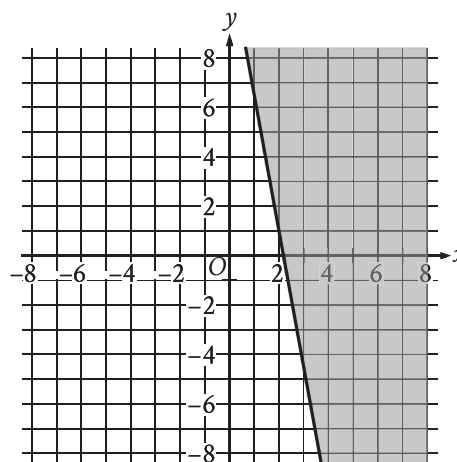
The shaded region shown represents solutions to an inequality. Which ordered pair (x, y) is a solution to this inequality?

A) $(0, -4)$

B) $(0, 4)$

C) $(-4, 0)$

D) $(4, 0)$

13

In triangle JKL, the measures of $\angle K$ and $\angle L$ are each 48°. What is the measure of $\angle J$, in degrees? (Disregard the degree symbol when entering your answer.)

CONTINUE

14

$$y = x^2 + 14x + 48$$
$$x + 8 = 11$$

The solution to the given system of equations is (x, y). What is the value of y ?

15

A cleaning service that cleans both offices and homes can clean at most 14 places per day. Which inequality represents this situation, where f is the number of offices and h is the number of homes?

A) $f + h \leq 14$

B) $f + h \geq 14$

C) $f - h \leq 14$

D) $f - h \geq 14$

16

Which expression is a factor of $2x^2 + 38x + 10$?

A) 2

B) $5x$

C) $38x$

D) $2x^2$

17

The equation $40x + 20y = 160$ represents the number of sweaters, x, and number of shirts, y, that Yesenia purchased for $160. If Yesenia purchased 2 sweaters, how many shirts did she purchase?

A) 3

B) 4

C) 8

D) 40

18

$$y = 0.25x^2 - 7.5x + 90.25$$

The equation gives the estimated stock price y, in dollars, for a certain company x days after a new product launched, where $0 \leq x \leq 20$. Which statement is the best interpretation of $(x, y) = (1, 83)$ in this context?

A) The company's estimated stock price increased $83 every day after the new product launched.

B) The company's estimated stock price increased $1 every 83 days after the new product launched.

C) 1 day after the new product launched, the company's estimated stock price is $83.

D) 83 days after the new product launched, the company's estimated stock price is $1.

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CONTINUE

19

$$f(x) = 39$$

For the given linear function f, which table gives three values of x and their corresponding values of $f(x)$?

A)

x	$f(x)$
0	0
1	0
2	0

B)

x	$f(x)$
0	39
1	39
2	39

C)

x	$f(x)$
0	0
1	39
2	78

D)

x	$f(x)$
0	39
1	0
2	−39

20

A triangular prism has a height of 8 centimeters (cm) and a volume of 216 cm^3. What is the area, in cm^2, of the base of the prism? (The volume of a triangular prism is equal to Bh, where B is the area of the base and h is the height of the prism.)

21
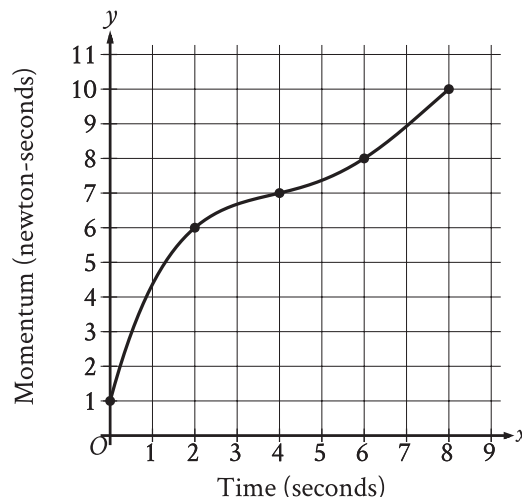
The graph shows the momentum y, in newton-seconds, of an object x seconds after the object started moving, for $0 \le x \le 8$. What is the average rate of change, in newton-seconds per second, in the momentum of the object from $x = 2$ to $x = 6$?

22

$$-15x + 25y = 65$$

One of the two equations in a system of linear equations is given. The system has infinitely many solutions. Which of the following could be the second equation in the system?

A) $12x + 20y = 52$

B) $12x + 20y = -52$

C) $-12x + 20y = 52$

D) $-12x + 20y = -52$

44

CONTINUE

23

A bus traveled on the highway and on local roads to complete a trip of 160 miles. The trip took 4 hours. The bus traveled at an average speed of 55 miles per hour (mph) on the highway and an average speed of 25 mph on local roads. If x is the time, in hours, the bus traveled on the highway and y is the time, in hours, it traveled on local roads, which system of equations represents this situation?

A) $55x + 25y = 4$
$x + y = 160$

B) $55x + 25y = 160$
$x + y = 4$

C) $25x + 55y = 4$
$x + y = 160$

D) $25x + 55y = 160$
$x + y = 4$

24

Quadrilateral $P'Q'R'S'$ is similar to quadrilateral $PQRS$, where P, Q, R, and S correspond to P', Q', R', and S', respectively. The measure of angle P is 30°, the measure of angle Q is 50°, and the measure of angle R is 70°. The length of each side of $P'Q'R'S'$ is 3 times the length of each corresponding side of $PQRS$. What is the measure of angle P' ?

A) 10°
B) 30°
C) 40°
D) 90°

25

$$f(x) = 2x + 244$$

The given function f represents the perimeter, in centimeters (cm), of a rectangle with a length of x cm and a fixed width. What is the width, in cm, of the rectangle?

A) 2
B) 122
C) 244
D) 488

26

The functions f and g are defined by the given equations, where $x \geq 0$. Which of the following equations displays, as a constant or coefficient, the maximum value of the function it defines, where $x \geq 0$?

    I. $f(x) = 33(0.4)^{x+3}$

    II. $g(x) = 33(0.16)(0.4)^{x-2}$

A) I only

B) II only

C) I and II

D) Neither I nor II

27

$$64x^2 - (16a + 4b)x + ab = 0$$

In the given equation, a and b are positive constants. The sum of the solutions to the given equation is $k(4a + b)$, where k is a constant. What is the value of k ?

STOP

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

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ANSWER EXPLANATIONS

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Reading and Writing

Module 1
(33 questions)

QUESTION 1

Choice B is the best answer because as used in the text, a span of time is described as "a void" space, which most nearly means an empty or vacant one. In the text, the speaker describes summertime in counterintuitive terms: although nature's "surging life is at its full" during the season, the speaker feels summer to be "a time of pause, / A void and silent space between two worlds." The speaker says further that during summer, "feeling sleeps / Gathering strength" for future efforts. Thus, the speaker regards summer as an empty stretch of time, to be followed by a period of greater activity.

Choice A is incorrect. Although the text does present summer as a time of inactivity, it doesn't characterize that inactivity as useless, or as having no purpose; in fact, the speaker regards summer as a time when "feeling" gathers "strength for efforts yet to come." *Choice C* is incorrect. Although the text characterizes summer as a time "when inspiration lags, and feeling sleeps," it doesn't discuss the season's relationship to the speaker's memory or suggest that summer can easily be forgotten. *Choice D* is incorrect. In some contexts, "void" can mean devoid of, or lacking, a particular element, and such a lack could be conceived of as incompleteness. However, the text doesn't portray summer as not being complete or whole; instead, it characterizes vacancy or inactivity as being an essential quality of the season, as experienced by the speaker.

QUESTION 2

Choice D is the best answer because it most logically completes the text's discussion of Sam Gilliam's artworks. As used in this context, "creating" means producing or bringing something into existence. The text indicates that Gilliam is an artist who made draped canvases and, later, quilt-like paintings. This context supports the idea that Gilliam explored different styles in his art by creating special types of paintings.

Choice A is incorrect because the text indicates that Gilliam actually explored and pursued the creation of quilt-like paintings; he wasn't just "predicting," or declaring in advance, the existence of these paintings. *Choice B* is incorrect because in this context "refusing" would mean rejecting, and there is nothing in the text to suggest that Gilliam rejected his quilt-like paintings. Instead, the text indicates that he was exploring and pursuing a new art style in these paintings. *Choice C* is incorrect because in this context "hiding" would mean concealing from view, and there is nothing in the text to suggest that Gilliam attempted to conceal his quilt-like paintings. Instead, the text indicates that he was exploring and pursuing a new art style in these paintings.

QUESTION 3

Choice B is the best answer because it most logically completes the text's discussion about Kouchaki and colleagues' research into how workload affects productivity. In context, "efficient" means effective or well organized. The text indicates that, according to Kouchaki and colleagues' research, people who worked on hard tasks first were "more skilled and productive" than those who did easy tasks first. This context conveys the idea that despite their sense of accomplishment, the people who chose to do the easy tasks first were less efficient or productive than those who tackled hard tasks first.

Choice A is incorrect because there's nothing in the text to suggest that workers who do easy tasks first are less "secretive," or uncommunicative or silent, than those who do hard tasks first. Rather, the text suggests that people are less skillful or efficient if they tackle easy tasks before the hard ones. *Choice C* is incorrect because "outgoing" means openly friendly, which wouldn't make sense in this context. The text focuses on Kouchaki and colleagues' research in which people who worked on hard tasks first were "more skilled and productive" than those who did easy tasks first and were therefore less efficient. *Choice D* is incorrect because there's nothing in the text to suggest that workers who do easy tasks first are less "unsympathetic," or insensitive or unkind, than those who do hard tasks first. Rather, the text suggests that people are less skillful or efficient if they tackle easy tasks before the hard ones.

QUESTION 4

Choice B is the best answer because as used in the text, "disturbed" most nearly means alarmed. The text portrays the narrator traveling in a carriage as wolves howl in the surrounding darkness. The text contrasts the reaction of both the narrator and the horses pulling the carriage with that of the driver of the carriage: the narrator and horses are "dreadfully afraid," but the driver is "not in the least disturbed." In other words, the driver is not alarmed by the wolves nearby.

Choice A is incorrect. Although in some contexts, "disturbed" can mean disorganized, the text doesn't portray a character acting in a disorganized manner; instead, the driver continues to drive the carriage, even though the horses pulling it are alarmed. *Choice C* is incorrect. Although in some contexts, "disturbed" can mean offended, the text doesn't portray one character feeling offended, or upset, by another's actions; instead, it contrasts the fear felt by the narrator with another character's lack of fear. *Choice D* is incorrect. Although in some contexts, "disturbed" can mean interrupted, the text doesn't portray an action being interrupted; indeed, the travel depicted in the scene continues despite the threat of the wolves outside the carriage.

QUESTION 5

Choice A is the best answer because as used in the text, "suggestion" most nearly means trace. The text portrays the narrator standing on the deck of a boat, admiring the view of nature afforded by this position: "My soul had left its body to lose itself in the wild unrestrained beauty around me," says the narrator, "and only left a trembling suggestion of its existence within me." This intense response to beauty is such that the narrator's soul seems to disengage from its body, leaving behind only a barely detectible indication of its presence there. In other words, the narrator senses only a trace of soul left in the body.

Choice B is incorrect. Although in some contexts "suggestion" can refer to an implied or indirectly expressed opinion, the text doesn't portray the narrator expressing an opinion; instead, the narrator is explaining an experience of intense emotion. *Choice C* is incorrect. While "suggestion" might be used in some contexts to refer to the tactful expression of a differing viewpoint, it doesn't refer to the dispute or difference of opinion itself. Moreover, the text doesn't portray a dispute between characters with differing viewpoints. *Choice D* is incorrect. Although in some contexts, "suggestion" might be used to refer to a politely worded command, the text doesn't portray a scenario in which someone receives such a command.

QUESTION 6

Choice D is the best answer because it most accurately describes the main purpose of the text. The text begins by noting that Anne "reveled in the world of color about her"—that is, she takes great delight in colorful things. It then relates a scene when she enthusiastically enters the house with autumn foliage and announces that she will decorate her room with it. The focus of the text then shifts to Marilla, who has an undeveloped "aesthetic sense," or appreciation of beauty, as can be seen when she dismisses the maple leaves as "messy things" and criticizes Anne for cluttering her room with objects from outside. This episode thus illustrates that Anne and Marilla differ in their appreciation of beauty and, more generally, in their basic character: Anne is exuberant and joyful, while Marilla is stern and critical. Therefore, the purpose of the text is to show that Anne and Marilla have very different personalities.

Choice A is incorrect because the text presents Anne's appreciation of nature as a basic personality trait, not as a newfound enthusiasm, and never indicates how recently she developed that appreciation. *Choice B* is incorrect. Although the text portrays Anne and Marilla as having different personalities and attitudes toward natural beauty and home decoration, it doesn't show them engaging in an argument about this difference or suggest that they often argue about it. *Choice C* is incorrect. Although the text does indicate that Marilla disapproves of how Anne plans to decorate her room, Marilla's disapproval is a supporting detail that serves to develop her personality, which the text as a whole contrasts with Anne's personality.

QUESTION 7

Choice A is the best answer because it most accurately describes the text's purpose, which is to discuss the important role Barrier Williams played in supporting many other Black women as they relocated to the northern United States during the early years of the Great Migration. After introducing Barrier Williams, the text describes how she helped find jobs for other Black women, who in many cases relocated in search of better employment prospects than the South could offer at the time. The text indicates that by doing so, she eased these women's transition as their circumstances changed.

Choice B is incorrect. Although the text mentions Barrier Williams's work as a political activist and writer for the *Chicago Defender*, it doesn't discuss any professional connections she made in these roles or indicate that she used any such connections in her work to secure employment for other Black women. *Choice C* is incorrect. Although the text discusses a factor that caused many women to relocate during the Great Migration, their difficulty finding employment in the South, the text doesn't indicate that this factor motivated the start of the Great Migration. Moreover, the text doesn't discuss the factors that motivated Black men to migrate. *Choice D* is incorrect. Although the text mentions the difficult employment prospects for Black women in the domestic and agricultural sectors in the South during the Great Migration, the text's main purpose isn't to provide an overview of the employment challenges Black women faced in these sectors. Rather, it provides this information to show that Barrier Williams played a crucial role in supporting many Black women who relocated to the North by helping them achieve one of their main goals, securing a job.

QUESTION 8

Choice A is the best answer because it most accurately describes the function of the underlined question in the text as a whole. The text begins with the underlined question, "How lifelike are they?" The text then explains that many computer animators pose this question about the environments and lighting that they create for animated films, striving for realistic animation of those components even if the characters themselves aren't portrayed in realistic terms. The focus of the text then shifts to describe how some animators strive to create environments and lighting that reflect the film's unique stories rather than making them appear realistic. Therefore, the function of the underlined question is to reflect a primary goal that many computer animators have for certain components of the animations they produce.

Choice B is incorrect because, as the text makes clear, the underlined question is one posed by computer animators who wish to create realistic backgrounds and lighting effects, not by those who, instead, wish to create effects that reflect films' unique stories and aren't necessarily realistic; this latter group of animators is discussed later in the text. *Choice C* is incorrect. As the text explains, many computer animators strive for realistic environments and lighting, while others do not; this difference of approach relates to whether these components should be realistic, not to how realism can be achieved using current technology, and the text never suggests that animators are uncertain how to achieve it. *Choice D* is incorrect because the underlined question pertains to the perspective of computer animators, not the audience, and the text never considers audience's reactions to characters in animated films.

QUESTION 9

Choice C is the best answer because it most accurately describes the main purpose of the text, which is to summarize a finding suggesting that some mechanisms in the brains of certain insects resemble mechanisms in mammalian brains. The text begins by explaining that feelings such as pleasure and displeasure are linked to chemical processes in the brain, such as the release of dopamine when one receives a reward. The text then indicates that such processes have been seen in mammals but that researchers have recently observed similar processes involving dopamine in honeybees. Taken together, this information serves to sum up the discovery that some mechanisms in the brains of certain insects may resemble mechanisms linked to feelings such as pleasure and displeasure in mammals.

Choice A is incorrect because the text doesn't describe any experiments or experimental methods. Instead, the text describes a phenomenon that has been observed in mammals and then presents the recent observations of Huang and colleagues that this phenomenon is also seen in honeybees. *Choice B* is incorrect because there's nothing in the text to suggest that certain insects can express how they're feeling through particular processes. The text does indicate that certain honeybee behaviors such as foraging are linked to dopamine, but it doesn't suggest that these behaviors enable honeybees to communicate feelings or sensations. *Choice D* is incorrect because the text presents research showing that certain honeybee behaviors such as foraging are linked to dopamine and therefore may be motivated by similar mechanisms to those in mammalian brains, not that honeybees and mammals behave similarly when there is the possibility of reward for their actions.

QUESTION 10

Choice D is the best answer because it most accurately describes the moon with the eccentric orbit. The text indicates that three of the 20 newly discovered moons have prograde orbits, meaning that they orbit Saturn in the same direction as the planet's spin, while the other 17 moons have retrograde orbits, meaning that they orbit Saturn in the opposite direction of the planet's spin. The text then states that 19 of the 20 moons appear to be the remains of earlier bodies that orbited Saturn but were broken apart in collisions. The one exception is a moon that orbits Saturn in the same direction as the planet's spin, meaning that the exceptional moon's orbit is prograde. The text goes on to state that the exceptional moon's orbit is so eccentric that the moon may have formed through a different process than the other 19 moons. The moon with the eccentric orbit, therefore, has a prograde orbit and may not be a remnant of an earlier body that orbited Saturn.

Choice A is incorrect because nothing in the text supports the idea that the moon with the eccentric orbit likely has the same origin as the moons with retrograde orbits. Although it's true that the moon has a prograde orbit (and thus doesn't have a retrograde orbit), the only information the text provides about the moon's origin is that it may be different than the origin of the other 19 moons. *Choice B* is incorrect because the text states that the moon in question orbits Saturn in the same direction as the planet's spin, meaning that the moon's orbit is prograde, not that its orbit is neither prograde nor retrograde. *Choice C* is incorrect because the text merely notes that the moon in question has a prograde orbit without giving any indication of what likely caused that orbit.

QUESTION 11

Choice D is the best answer because it most accurately states the main idea of the text. The text states that some scholars have dated the composition of *Beowulf* to the late ninth through early eleventh centuries due to the poem's fit with that period's historical context. The text goes on to say that while it is "not inconceivable that *Beowulf* emerged from such a context"—that is, it is possible that *Beowulf* was composed during the late ninth through eleventh centuries— there is linguistic evidence that the poem was composed earlier, in the seventh or eighth century. According to the text, favoring the historical context over the linguistic evidence requires justification that scholars have not yet supplied. In other words, the text suggests that scholars who favor the later composition date need to explain why the poem's fit with historical context should take precedence over the linguistic evidence, but they have not yet done so. Thus, the main idea of the text is that while there is some plausibility to the later composition date, advocates for the later date have not compellingly addressed evidence suggestive of an earlier date.

Choice A is incorrect because the text says that scholars who date the poem to the late ninth through early eleventh centuries have failed to account for the linguistic evidence that the poem may have been composed earlier, not that the evidence those scholars cite in favor of their view is unreliable or that anyone has cast doubt on that evidence. In other words, the text does not suggest that there are problems with the evidence cited by advocates of the later composition

date, only that there is other evidence of an earlier composition date that those advocates need to consider. *Choice B* is incorrect because nothing in the text suggests that those scholars who date the poem to the late ninth through early eleventh centuries are giving priority to a controversial view of the social conditions at that time. The text makes no reference to any controversy about how scholars interpret that historical period. Instead, the text suggests that scholars who date the poem on the basis of its fit with the historical context of England in the late ninth through early eleventh centuries have failed to account for linguistic evidence that the poem may have been composed earlier. *Choice C* is incorrect because the text says nothing about how well the poem fits the historical context of England in the seventh and eighth centuries, let alone that it fits that historical context as well as it fits the historical context of the late ninth through early eleventh centuries. Rather, the text says that there is linguistic evidence that the poem may have been composed in the seventh or eighth century.

QUESTION 12

Choice A is the best answer because it uses data from the table to effectively support the claim that book genres that typically require the reader to start at the beginning of the story and read straight through are more commercially successful as e-books than other genres. For each of three years, the table presents four book genres and the percentage of total sales for each genre in e-book format. Cookbooks, a nonfiction genre, do not require the reader to read straight through. According to the table, 10.5 percent of total cookbook sales in 2016 were in the e-book format. The 2016 percentage of e-book sales was 36.7 percent in the science fiction and fantasy genre, which are typically stories read straight through from start to finish. The higher percentage of total sales of the story-based e-books in 2016 supports the claim in the text.

Choice B is incorrect because it compares the e-book sales of romance books in 2006 to those in 2016. Romance books are meant to be read straight through from start to finish. The text claims that books that are not stories and do not require reading straight through are not as commercially successful in e-book format as those that do. As this choice is only comparing e-book sales for one genre, it does not support the claim. *Choice C* is incorrect because both science fiction and fantasy and romance novels are fiction books meant to be read straight through from beginning to end. The text claims that books that are not stories and do not require reading straight through are less commercially successful in e-book format than those that do. As this choice does not compare e-book sales of story genres to e-book sales in genres that are not stories, it does not support the claim. *Choice D* is incorrect. Although the data in the table show that the travel guide e-books made up a greater percentage of total sales in 2016 than in 2011, this doesn't illustrate the claim in the text that e-books in nonfiction genres not meant to be read straight through are less commercially successful. The claim cannot be supported without comparing the percentage of e-book sales between fiction and nonfiction book genres from the table.

QUESTION 13

Choice D is the best answer because it presents a finding that, if true, would challenge the assumption that many ecologists have made about the connection between the building of domed nests and geographic range in songbirds. The text says that many ecologists have assumed that since domed nests provide protection from weather conditions, songbird species that build such nests should be able to have larger geographic ranges than songbird species that build open nests do. If Medina and her colleagues found that species that build open nests tend to have larger geographic ranges than species that build domed nests do, their finding would show the opposite of what the ecologists have assumed. It would therefore challenge the ecologists' assumption.

Choice A is incorrect because nothing in the text suggests that there's a relationship between songbird species' extinction rates and their geographic ranges. The finding that species that build open nests tend to have higher extinction rates than species that build domed nests do would therefore have no clear bearing on the ecologists' assumption that domed nests allow species that build them to have larger geographic ranges than those of species that build open nests. *Choice B* is incorrect because nothing in the text suggests that there's a relationship between songbird species' sizes and their geographic ranges. The finding that species that build open nests tend to be smaller in size than species that build domed nests are would therefore have no clear bearing on the ecologists' assumption that domed nests allow species that build them to have larger geographic ranges than those of species that build open nests. *Choice C* is incorrect because although the text indicates that many ecologists have assumed that there's a connection between how songbird species build their nests and the species' geographic ranges, the text says that this assumption is based on the shape of the nests—that is, whether the nests are domed or open—not the number of materials used. The finding that species that build open nests tend to use fewer materials to build their nests than species that build domed nests do would therefore have no clear bearing on the ecologists' assumption that domed nests allow species that build them to have larger geographic ranges than those of species that build open nests.

QUESTION 14

Choice D is the best answer because it provides a quotation that effectively supports the student's claim about the film *One Night in Miami…*. The quotation states that in researching the play on which the film was based, Kemp Powers only found superficial details about what actually happened during the 1964 meeting in Miami between four leading Civil Rights leaders, meaning that there is very little information about the meeting in the historical record. In the absence of greater details, it wouldn't have been possible for the film to be a precise retelling of the historical events it depicts. The quotation explains that to compensate for this lack of information about the meeting, Powers did extensive research into the four figures and how they thought at the time in order to speculate in an informed way about what they might have said or what might have occurred between them. Therefore, the quotation effectively supports the claim that the film is best understood not as a precise retelling of a historical event but as a deeply informed imaginative rendering of that event.

Choice A is incorrect. Although the quotation discusses how on learning about the 1964 meeting in Miami, Powers was inspired to write a play and, later, to adapt it into a screenplay, it doesn't discuss Powers's approach to representing what had occurred in the meeting. Instead, it states that Powers didn't initially plan to write a story only "focusing on the meeting itself" but rather had considered writing a "much longer" and more expansive work about the meeting's four participants. *Choice B* is incorrect because the quotation doesn't discuss Powers's approach to representing historical events in his play and in the film; instead, the quotation focuses on the film's positive critical reception by mentioning that it received numerous awards and nominations. *Choice C* is incorrect. Although the quotation references historical events that are discussed directly in the play and film by explaining how the four historical figures featured in the story engage in political debates about contemporary issues, it doesn't specify to what extent Powers's representation of what occurred during the 1964 meeting in Miami is a factual retelling of what happened and how much is an imaginative rendering of what might have happened. Rather, the quotation focuses on Powers's description of the film's basic premise and how the characters engage with the historical context of its setting.

QUESTION 15

Choice B is the best answer because it most logically completes the text's discussion of Lemay, Zyats, and Bezur's 2021 analysis of the Vinland Map. The text indicates that while some scholars have believed that the map was drawn in the mid-1400s, the 2021 analysis showed the presence of the compound titanium dioxide in the ink used to draw the map. The text goes on to say that titanium dioxide wasn't used to manufacture ink until the early 1900s, which means that ink containing this compound couldn't have been available to mapmakers in the 1400s. Since mapmakers in the mid-1400s couldn't have used ink with titanium dioxide, it follows that the Vinland Map couldn't have been drawn by mid-1400s mapmakers.

Choice A is incorrect because the 2021 finding that the ink used to draw the Vinland Map wasn't available until the early 1900s doesn't imply that Europeans in the mid-1400s couldn't have known about the eastern coast of North America. While this finding suggests that the map couldn't have been created in the mid-1400s, it doesn't preclude the possibility that Europeans nevertheless had knowledge—and perhaps even drew other maps that are no longer in existence or are yet to be discovered by researchers—of the eastern coast of present-day North America as early as the mid-1400s. *Choice C* is incorrect because there's nothing in the text that suggests that the 2021 discovery of the presence of titanium dioxide in the ink used to draw the Vinland Map caused Lemay, Zyats, and Bezur to question or reach a new conclusion about when mapmakers began using ink containing titanium compounds. Instead, the text indicates that titanium dioxide wasn't used in ink before the early 1900s. This knowledge led the team to conclude that the map, which was drawn with ink containing titanium dioxide, couldn't have been created in the mid-1400s. *Choice D* is incorrect because although the text doesn't indicate that Lemay, Zyats, and Bezur established an exact date for the creation of the ink that was used to draw the Vinland Map, the

text does say that titanium dioxide was introduced in ink manufacturing in the early 1900s. This fact provides enough information to determine that the ink that was used to draw the map was created no earlier than the early 1900s. This finding, in turn, led the team to conclude that the Vinland Map couldn't have been drawn in the mid-1400s.

QUESTION 16

Choice D is the best answer because it most logically completes the text's discussion of aerogels. The text states that aerogels—highly porous foams—offer "excellent insulation" but typically break down after prolonged exposure to high heat. However, according to the text, Duan and colleagues developed an aerogel that "contracts rather than expands when heated" and recovers its original volume after this contraction. Thus, it is logical to conclude that Duan's team's aerogel material will be less prone to the structural weakness that caused earlier aerogels to break down.

Choice A is incorrect. Although the text indicates that aerogels consist "mainly of tiny air pockets within a solidified gel," it doesn't mention the number or proportion of air pockets to solidified gel in typical aerogels or in the aerogel developed by Duan's team. *Choice B* is incorrect because the text suggests that the aerogel developed by Duan's team has a higher, not a lower, ability to withstand exposure to intense heat due to its contraction and subsequent recovery. *Choice C* is incorrect. Although the text discusses temperature tolerances of aerogels and says that they offer "excellent insulation despite typically being brittle and eventually fracturing," it doesn't discuss how different rates of temperature change can affect aerogels.

QUESTION 17

Choice B is the best answer because it presents the conclusion that most logically follows from the text's discussion of *A. mexicanus*. According to the text, *A. mexicanus*, a river-dwelling fish species, has colonized caves. The fish that live in rivers and those that live in caves show no significant genetic differences and are all capable of making the same sounds. The text indicates, however, that Hyacinthe and colleagues found that sounds that the river fish use in a particular context and for a particular purpose are used in a different context and for a different purpose by the cave fish. Additionally, the sounds made by cave fish show some differences depending on the specific cave the fish inhabit. The text goes on to state that Hyacinthe and colleagues have noted that differences in how the fish use sound to communicate could eventually become so great that they prevent fish from different locations from interbreeding. In other words, the river fish might eventually only breed with other river fish (with whom they share characteristics regarding sonic communication that they do not share with cave fish), while the cave fish might only breed with other cave fish for a similar reason. In context, this observation suggests that even though the fish are a single species right now, they could be in the process of splitting into distinct populations with different characteristics.

Choice A is incorrect because there is no information in the text suggesting that the river fish are less reliant on sonic communication than the cave fish are. Although the text does indicate that the river fish and cave fish are genetically similar, the text describes both groups as using sonic communication and says nothing to indicate that one group depends on that communication more than the other group does. *Choice C* is incorrect. The text states that all members of the species can emit the same sounds but that the function and context of sounds differ depending on whether the fish live in rivers or caves, but it does not indicate that river fish produce sounds that cave fish do not or vice versa. *Choice D* is incorrect because it contradicts the text. The text says that there is little genetic difference between the river fish and the cave fish, not that the river fish and cave fish are so genetically distinct that they can be considered separate species.

QUESTION 18

Choice C is the best answer because it most logically completes the text's discussion of Johny Isla and the whalelike geoglyph. The text indicates that the German exhibit about the Nazca Lines included a photograph showing a whalelike geoglyph that Isla hadn't known about before attending the exhibit, even though Isla "specializes in" Nazca Lines geoglyphs. Given his expertise, and his surprise at being unfamiliar with the whale glyph, the text strongly suggests that Isla believed he would have noticed the glyph if he had been to its location. Thus, the text implies that the whalelike geoglyph is likely in a location Isla had not previously been to.

Choice A is incorrect because the text doesn't address either the species of whale that the geoglyph is meant to represent or its relationship to the earliest humans in the area that is now Peru. *Choice B* is incorrect. Although the text indicates that the photograph of the whalelike geoglyph was on display at a "German exhibit," that exhibit was specifically "about the Nazca Lines," which the text indicates are located in Peru. *Choice D* is incorrect. Although the text does indicate that the glyphs were created "over a period of many centuries," the text doesn't address when in that period of time any particular glyphs were created.

QUESTION 19

Choice C is the best answer. The convention being tested is the use of nonfinite verb forms within a sentence. Working together with the finite verb "need," the nonfinite to-infinitive verb "to digest" is correctly used to form a subordinate clause that describes what the reindeer need.

Choice A is incorrect because the verb "digest" (in either its finite or nonfinite form) can't be used in this way with the finite verb "need." *Choice B* is incorrect because the finite verb "will digest" can't be used in this way with the finite verb "need." *Choice D* is incorrect because the nonfinite participle "digesting" can't be used in this way with the finite verb "need."

QUESTION 20

Choice C is the best answer. The convention being tested is the use of nonfinite verb forms within a sentence. The nonfinite present participle "including" is correctly used to form a participial phrase that supplements the main clause "he patented many inventions," listing several of Spikes's patented inventions.

Choice A is incorrect because the finite past tense verb "included" can't be used in this way to supplement the main clause "he patented many inventions." *Choice B* is incorrect because the finite present tense verb "includes" can't be used in this way to supplement the main clause "he patented many inventions." *Choice D* is incorrect because the finite future tense verb "will include" can't be used in this way to supplement the main clause "he patented many inventions."

QUESTION 21

Choice A is the best answer. The convention being tested is subject-verb agreement. The singular verb "occurs" agrees in number with the singular subject "radiation."

Choice B is incorrect because the plural verb "have occurred" doesn't agree in number with the singular subject "radiation." *Choice C* is incorrect because the plural verb "occur" doesn't agree in number with the singular subject "radiation." *Choice D* is incorrect because the plural verb "are occurring" doesn't agree in number with the singular subject "radiation."

QUESTION 22

Choice B is the best answer. The convention being tested is the use of verbs to express tense in a sentence. In this choice, the past tense verb "vowed" is consistent with the other past tense verbs ("guided" and "upheld") used to narrate the events surrounding President Roosevelt's decision to conserve the nation's wilderness areas.

Choice A is incorrect because the present progressive tense verb "is vowing" isn't consistent with the past tense verbs used to narrate the events surrounding President Roosevelt's decision to conserve the nation's wilderness areas. *Choice C* is incorrect because the future tense verb "will vow" isn't consistent with the past tense verbs used to narrate the events surrounding President Roosevelt's decision to conserve the nation's wilderness areas. *Choice D* is incorrect because the simple present tense verb "vows" isn't consistent with the past tense verbs used to narrate the events surrounding President Roosevelt's decision to conserve the nation's wilderness areas.

QUESTION 23

Choice C is the best answer. The convention being tested is the punctuation of a supplementary element within a sentence. The comma after "that" pairs with the comma after "roles" to separate the supplementary element "among their many roles" from the rest of the sentence. This supplementary element functions to clarify that polyphenols have many roles, and the pair of commas indicates that this element could be removed without affecting the grammatical coherence of the sentence.

Choice A is incorrect because a dash can't be paired with a comma to separate the supplementary element from the rest of the sentence. *Choice B* is incorrect because a semicolon can't be paired with a comma to separate the supplementary element from the rest of the sentence. *Choice D* is incorrect because a colon can't be paired with a comma to separate the supplementary element from the rest of the sentence.

QUESTION 24

Choice A is the best answer. The convention being tested is the use of plural nouns. The plural nouns "musicians" and "audiences" correctly indicate that there were multiple musicians introducing the music to multiple audiences.

Choice B is incorrect because the context requires the plural nouns "musicians" and "audiences," not the plural possessive nouns "musicians'" and "audiences'." *Choice C* is incorrect because the context requires the plural nouns "musicians" and "audiences," not the singular possessive nouns "musician's" and "audience's." *Choice D* is incorrect because the context requires the plural noun "musicians," not the plural possessive noun "musicians'."

QUESTION 25

Choice B is the best answer. The convention being tested is punctuation between a supplementary element and a main clause. This choice correctly uses a comma to mark the boundary between the supplementary phrase ("While...1947"), which indicates when the action occurred, and the main clause ("Howe had a handheld camera operator wear roller skates").

Choice A is incorrect because a comma paired with the conjunction "and" can't be used in this way to mark the boundary between the supplementary element ("While...1947") and the main clause ("Howe...skates"). *Choice C* is incorrect because the conjunction "and" can't be used in this way to join the supplementary element ("While...1947") and the main clause ("Howe...skates"). *Choice D* is incorrect because it fails to mark the boundary between the supplementary element and the main clause with appropriate punctuation.

QUESTION 26

Choice D is the best answer. The convention being tested is subject-verb agreement. The singular verb "was" agrees in number with the singular subject "amplifying." Gerunds such as "amplifying" are always singular.

Choice A is incorrect because the plural verb "were" doesn't agree in number with the singular subject "amplifying." *Choice B* is incorrect because the plural verb "have been" doesn't agree in number with the singular subject "amplifying." *Choice C* is incorrect because the plural verb "are" doesn't agree in number with the singular subject "amplifying."

QUESTION 27

Choice C is the best answer. "For example" logically signals that the following information about Ky—that she once shaped her hair to look like Africa—is an example supporting the previous statement that she makes different shapes with her hair.

Choice A is incorrect because "soon" illogically signals that the event described in this sentence occurred soon after the statement about Ky making different shapes with her hair. Instead, the sentence provides an example of one of these shapes. *Choice B* is incorrect because "elsewhere" illogically signals that the event described in this sentence occurred in a different place than the statement about Ky making different shapes with her hair. Instead, the sentence provides an example of one of these shapes. *Choice D* is incorrect because "however" illogically signals that the information in this sentence contrasts with the statement that Ky makes different shapes with her hair. Instead, the sentence provides an example of one of these shapes.

QUESTION 28

Choice A is the best answer. "Later" logically signals that the letter-writing discussed in this sentence occurred later in a chronological sequence of events than did the antidiscrimination case discussed in the previous sentence.

Choice B is incorrect because "for instance" illogically signals that the letter-writing discussed in this sentence is an example of the antidiscrimination case discussed in the previous sentence. Instead, the letter-writing is an event that occurred after the court case. *Choice C* is incorrect because "in other words" illogically signals that the letter-writing discussed in this sentence is a paraphrase or restatement of the antidiscrimination case discussed in the previous sentence. Instead, the letter-writing is an event that occurred after the court case. *Choice D* is incorrect because "rather" illogically signals that the letter-writing discussed in this sentence is an alternative to the antidiscrimination case discussed in the previous sentence. Instead, the letter-writing is an event that occurred after the court case.

QUESTION 29

Choice D is the best answer. "Then" logically signals that the event described in this sentence—carbon in phytoplankton cells being trapped in sediment after the organisms have died—occurs later in a chronological sequence than the event described in the previous sentence (phytoplankton absorbing carbon while alive).

Choice A is incorrect because "specifically" illogically signals that the information that follows provides specific, precise details elaborating on the previous information about what phytoplankton do when alive. Instead, this sentence explains what happens after phytoplankton die—a later step in the chronological sequence of events. *Choice B* is incorrect because "by contrast" illogically signals that the information that follows contrasts with the previous information about what phytoplankton do when alive. Instead, this sentence explains what happens after phytoplankton die—a later step in the chronological sequence of events. There is no contrast: in both life and death, phytoplankton contribute to the ocean's carbon uptake. *Choice C* is incorrect because "nevertheless" illogically signals that the information that follows is in spite of the previous information about what phytoplankton do when alive. Instead, this sentence explains what happens after phytoplankton die—a later step in the chronological sequence of events. There is no contrast: in both life and death, phytoplankton contribute to the ocean's carbon uptake.

QUESTION 30

Choice C is the best answer. "Similarly" logically signals that the information in this sentence about a labor monopsony is similar to the information in the previous sentence about a product monopsony. In both types of markets, one party (an employer or a buyer) has the power to force another party (a worker or seller) to accept less money (for labor or products).

Choice A is incorrect because "earlier" illogically signals that the information in this sentence about a labor monopsony occurs earlier (in a chronological sequence) than the information about a product monopsony. Instead, it is similar to the information about a product monopsony. *Choice B* is incorrect because "instead" illogically signals that the information in this sentence about a labor monopsony is an alternative to the previous information about a product monopsony. Instead, it is similar to the information about a product monopsony. *Choice D* is incorrect because "in particular" illogically signals that the information in this sentence about a labor monopsony provides specific details elaborating on the previous information about a product monopsony. Instead, it is similar to the information about a product monopsony.

QUESTION 31

Choice A is the best answer. The sentence contrasts the purposes of the two maps in *The Hobbit*, noting that the opening map introduces readers to the book's fictional world, while the closing map helps readers reconstruct the story. The word "while" helps signal a contrast between the purposes of the maps.

Choice B is incorrect. While the sentence mentions the two maps, it doesn't contrast the maps' purposes. *Choice C* is incorrect. While the sentence mentions the two maps and notes that each has a purpose, it doesn't specify what those purposes are or how they contrast. *Choice D* is incorrect. While the sentence mentions the two maps, it doesn't contrast the maps' purposes.

QUESTION 32

Choice C is the best answer. The sentence specifies the reason the Mayflower Compact was created, noting that it was created to establish a common government among the pilgrims that immigrated to Plymouth Colony.

Choice A is incorrect. While the sentence provides background information about the Mayflower Compact and notes the signatories' goal for the colony, it doesn't specify why the compact was created. *Choice B* is incorrect. While the sentence provides background information about the Mayflower Compact and notes the signatories' goal for the colony, it doesn't specify why the compact was created. *Choice D* is incorrect. The sentence specifies the number of pilgrims that signed the Mayflower Compact; it doesn't specify the reason the compact was created.

QUESTION 33

Choice D is the best answer because the sentence makes and supports a generalization about honeybees. It claims that honeybees living in urban areas are more likely to thrive than rural bees, and it supports the claim with information about the effect of a varied diet on urban bees' immune systems.

Choice A is incorrect. While the sentence makes a generalization, it doesn't mention honeybees. *Choice B* is incorrect. While the sentence provides data about honeybee survival, it doesn't make a generalization about honeybees based on this information. *Choice C* is incorrect. While the sentence makes a generalization about honeybees' diets and immune systems, it doesn't provide adequate support for this generalization.

Reading and Writing
Module 2
(33 questions)

QUESTION 1

Choice B is the best answer because it most logically completes the text's discussion of the archaeologists' study of the ancient amphitheater in Switzerland. In this context, "provide" means make available or supply. The text states that the archaeologists believe that the amphitheater dates to the fourth century CE. The text goes on to say that the archaeologists discovered a coin made between 337 and 341 CE (that is, made during the fourth century CE) and building materials appropriate to the era in question. This context suggests that these discoveries provide evidence for the archaeologists' theory about the dating of the amphitheater.

Choice A is incorrect because the archaeologists' discoveries are presented as supplying evidence in favor of their theory about the dating of the amphitheater, not something that would "dismiss," or reject serious consideration of, evidence for that theory. *Choice C* is incorrect because nothing in the text suggests that the archaeologists' discoveries would "regulate," or govern or bring order to, evidence for the archaeologists' theory about the dating of the amphitheater. The discoveries are presented as supplying evidence for the archaeologists' theory, not as changing how evidence for the theory is controlled or ordered. *Choice D* is incorrect because the archaeologists' discoveries are presented as supplying evidence in favor of their theory about the dating of the amphitheater, not something that would "refuse," or be unwilling to accept, evidence for the archaeologists' theory.

QUESTION 2

Choice C is the best answer because as used in the text, "simply" most nearly means easily, or involving minimal difficulty or effort. The text first provides Alice's reflections on her plan to gain access to a garden and then offers commentary on her plan by the novel's narrator. The text indicates that a reason Alice likes her plan despite not being fully thought through is that she nonetheless believes it can be efficiently arranged. In other words, the text indicates that one of the supposed benefits of Alice's plan is that it can be easily arranged.

Choice A is incorrect because the text describes how Alice's plan can be arranged, and it wouldn't make sense to say that it can be arranged "faintly," or with little strength or not strongly. Instead, the text indicates that the plan can be arranged with little difficulty. *Choice B* is incorrect. Although in some contexts "simply" can mean quickly, hastily, or hurriedly, the word "hastily" indicates that something is done too quickly. Although it may be true that Alice's plan was made in haste, the text doesn't focus on this aspect of her plan. Instead, the text focuses on the plan's seemingly good qualities, saying that Alice thinks of it as "the best," and the narrator refers to it as "excellent" and "neatly," or efficiently, arranged. *Choice D* is incorrect. Although in some contexts "simply" can mean foolishly, or lacking good sense, it doesn't have this meaning in this context. Although the text says that Alice doesn't know how to go about her plan, it begins by presenting her plan in a positive light: Alice describes her plan as "the best," and the narrator refers to the plan as "excellent" and "neatly," or efficiently, arranged.

QUESTION 3

Choice D is the best answer because it most logically completes the text's discussion of cucurbits. In this context, "ensuring" means guaranteeing, or making sure of, the cucurbits' survival. The text states that cucurbits faced extinction in the past because their means of seed dispersal disappeared, but the ancestors of Indigenous peoples in North America began farming cucurbits around that same time, so the crops were no longer threatened. Therefore, the context supports the idea that the ancestors of Indigenous peoples in North America helped with ensuring the cucurbits' survival.

Choice A is incorrect because in this context verifying means making sure that something is accurate. In the text, the ancestors of Indigenous peoples in North America were ensuring the survival, not the accuracy of, the cucurbits. *Choice B* is incorrect. Although the cucurbit crops themselves were multiplying, or growing in number, as a result of the work of the ancestors of Indigenous peoples in North America, it wouldn't make sense in context to say that the survival of the plants was multiplying. *Choice C* is incorrect because according to the text, in raising cucurbits as crops, the ancestors of Indigenous peoples in North America were attempting to help the plants grow and survive; they weren't attempting to comfort, or free the plants from pain.

QUESTION 4

Choice C is the best answer because it most logically completes the text's discussion of the discovery of a carved wooden figure dating to around 2,000 years ago. In this context, "rarely" means infrequently. The text states that the discovery of the figure was "truly surprising" and notes that wooden objects are highly prone to rot. This context conveys the idea that wooden objects infrequently survive for as long as the carved figure has survived.

Choice A is incorrect because "sturdily" means strongly, which wouldn't make sense in context. If wooden objects in general could strongly survive for long periods of time, then the discovery of a wooden figure that's around 2,000 years old wouldn't be surprising. *Choice B* is incorrect because "carelessly" means accidentally. The text conveys the idea that wooden objects in general don't survive for very long because they rot, not that wooden objects in general accidentally survive despite this. *Choice D* is incorrect because the text conveys the idea that wooden objects in general don't survive for very long because they rot, not that wooden objects in general "simply," or merely, survive for long periods of time. If wooden objects in general could merely survive for as long as the figure has survived, then the discovery of the figure wouldn't have been surprising.

QUESTION 5

Choice C is the best answer because it most logically completes the text's discussion of Ikeguchi's model of bicycle supply. In this context, "saturated with" means thoroughly or completely supplied with. The text explains a problem encountered by some bicycle-sharing programs: users can return bicycles to different locations than where the users picked up the bicycles to start, which can result in a mismatch between bicycle supply (that is, where the bicycles are currently located) and user demand (that is, the locations where users are hoping to pick up bicycles). The text goes on to explain that Ikeguchi developed a way to identify when this mismatch is likely to occur. This context suggests that Ikeguchi's method will show when it is likely that some locations have an insufficient supply and other locations, by implicit contrast, are saturated with bicycles.

Choice A is incorrect because nothing in the text suggests that some locations are "susceptible to," or sensitive to or easily influenced by, bicycles. The text describes the phenomenon of bicycles being redistributed away from locations where users want them, not anything about those locations being influenced by the bicycles. *Choice B* is incorrect because the text describes situations in which some locations have an insufficient supply of bicycles because the bicycles have been relocated elsewhere, which suggests that the other locations have many bicycles, not that the other locations are "contingent on," or dependent on, the bicycles. Nothing in the text suggests that the locations themselves depend on the bicycles for anything. *Choice D* is incorrect because it would not make sense in context to say that some locations are "depleted of," or empty of, bicycles while

others have an insufficient supply. The text describes situations in which bicycles have been relocated such that there is a mismatch between bicycle supply and user demand—the bicycles are no longer at the locations where users want to pick them up. This means that some locations do not have enough bicycles, while other locations must have many bicycles, not be depleted of bicycles.

QUESTION 6

Choice A is the best answer because it most accurately describes how the underlined sentence functions in the text as a whole. The first sentence explains that Bernabei and his team studied growth rings to obtain information about the ancient oak planks found during a construction project in Rome. The next sentence presents what the researchers learned: the wood from the planks came from France's Jura region, which is far from Rome. The underlined sentence then presents the implications of the findings about the planks: the wood must have been brought to Rome by boat, a difficult task that suggests Roman trade routes were complex. Thus, the underlined sentence mainly functions to present a conclusion about Roman trade routes based on the team's findings.

Choice B is incorrect because the text doesn't suggest that the team thought the ancient planks were used in the construction of a boat, nor does the underlined sentence question that conclusion. Instead, the text states that the wood could only have been transported from Jura to Rome in a boat. *Choice C* is incorrect because the underlined sentence simply offers a conclusion drawn from the team's findings about the likely place of origin of the ancient planks; the text never mentions why oak was chosen for the planks instead of other wood. *Choice D* is incorrect because neither the underlined sentence nor the text as a whole addresses any methods that Romans used in constructing subways. Instead, the underlined sentence offers a conclusion drawn from the team's findings about the likely place of origin of the ancient wooden planks discovered.

QUESTION 7

Choice C is the best answer because it most accurately describes the function of the underlined sentence in the text as a whole. The text's subject is Beverly Glenn-Copeland's 1986 album *Keyboard Fantasies*, notable for its innovative, experimental arrangements. According to the text, the album was not initially admired, but in recent years it has become popular among younger musicians. The underlined portion of the text mentions two of those musicians, Blood Orange and Moses Sumney, who "cite the album as an influence." Therefore, the underlined portion of the text offers examples of younger musicians whose work has been impacted by *Keyboard Fantasies*.

Choice A is incorrect because even though the underlined sentence states that Blood Orange and Moses Sumney were influenced by *Keyboard Fantasies*, it doesn't say that all other musicians should also embrace the album's experimental style. *Choice B* is incorrect. Although the text states that *Keyboard Fantasies* was not admired on its first release, the text doesn't present any criticism of the album by younger musicians: it only presents two younger musicians who cite it as an influence. *Choice D* is incorrect because the underlined sentence doesn't mention any differences between *Keyboard Fantasies* and the work of Blood Orange and Moses Sumney.

QUESTION 8

Choice C is the best answer because it most accurately describes the main purpose of the text, which is to illustrate two approaches that Indigenous politicians have taken to achieve political representation for their communities. The text begins by explaining that one approach is exemplified by Indigenous politicians in the United States who, in an effort to ensure that the interests of their communities are represented in government, joined preexisting political parties and were subsequently elected to Congress. The text goes on to highlight a second approach adopted by Indigenous leaders in Canada and several Latin American countries: rather than joining established political parties, many Indigenous politicians in these countries have instead formed their own parties to promote candidates for office who support causes that are important to their communities.

Choice A is incorrect because the text's focus is on the contrasting approaches adopted by different Indigenous political movements in different countries; thus, it isn't accurate to say that the text traces the history of one political movement. Moreover, the text only discusses examples from 2000 to 2021, a relatively short period of time; therefore, it provides very little in the way of discussion of larger historical developments, nor does it make any predictions about how these movements might continue to develop in the future. *Choice B* is incorrect because the text never urges Indigenous politicians in the US to alter their strategy of striving for representation through the established political parties, nor does it suggest that this strategy is inferior to that of Indigenous politicians in Canada and Latin America, who have formed their own parties. In fact, the text notes that both strategies have resulted in the election of Indigenous politicians to national governments. *Choice D* is incorrect because the text never suggests that Indigenous politicians in the US have influenced those in Canada and Latin America; instead, it stresses how Indigenous politicians' approach toward achieving representation in the US government has differed from the approach Indigenous politicians have taken to achieve representation in national governments elsewhere in the Americas.

QUESTION 9

Choice C is the best answer because it characterizes how Maddux would most likely respond to the conclusion Sharif reached after her research. Text 1 describes Sharif's study of the benefits of free time, saying that the reported sense of satisfaction plateaued at two hours per day and began to decline at five hours per day. Further research led Sharif to conclude that time spent doing tasks she defines as unproductive, such as watching TV or playing games, correlated with a drop in life satisfaction. However, in Text 2 Maddux says that there is no objective definition of what constitutes productive behavior, giving the example that reading a book might be considered productive by some but unproductive by others. It can be inferred that Maddux would also assert that whether watching TV or playing games is productive or unproductive is a matter of subjective judgment. Thus, Maddux would most likely caution against making an overly broad assumption, as there is no clear consensus in distinguishing between productive and unproductive activities.

Choice A is incorrect because Maddux asserts that individuals have unique needs for life satisfaction: some may want to spend that time productively, others unproductively, and what counts as productive is subjective. Therefore, Maddux would likely not consider it universally true that free time is more likely to enhance life satisfaction when it is spent productively. *Choice B* is incorrect because the study described in Text 1 concerns whether free time contributes to life satisfaction, not whether productivity contributes to life satisfaction. The dip in life satisfaction that Sharif claims to observe in Text 1 happens only after five hours, and mainly if the time is spent unproductively—that is, two hours of free time spent productively might increase life satisfaction just as much as two hours spent unproductively. *Choice D* is incorrect because Maddux holds the opinion that whether an activity is productive or unproductive is subjective and depends on the individual; therefore, he would most likely claim that watching TV or playing games might be productive for some and unproductive for others.

QUESTION 10

Choice C is the best answer because it gives the age for the fossil discovered by Wang and colleagues that is directly supported by the text. According to the text, Xin Wang and colleagues discovered a 164-million-year-old plant fossil. This plant fossil included a flower bud, which the researchers believe provides evidence that flowering plants emerged in the Jurassic period, which falls between 145 million and 201 million years ago.

Choice A is incorrect because the text states that Wang and colleagues discovered a 164-million-year-old flowering plant fossil in China, not one that is 150 million years old. Although 150 million years ago would fall within the Jurassic period, according to the text it isn't the age of the discovered fossil. *Choice B* is incorrect because the text states that Wang and colleagues discovered a 164-million-year-old flowering plant fossil in China, not one that is 145 million years old. Although 145 million years ago would fall at the end of the Jurassic

period, according to the text it isn't the age of the discovered fossil. *Choice D* is incorrect because the text states that Wang and colleagues discovered a 164-million-year-old flowering plant fossil in China, not one that is 201 million years old. Although 201 million years ago would fall at the beginning of the Jurassic period, according to the text it isn't the age of the discovered fossil.

QUESTION 11

Choice B is the best answer because it most accurately states the main idea of the text. The text indicates that dog owners typically claim that some dog breeds are "more likely than others to have particular personality traits." In other words, the text points out that a commonly held belief about dog breeds is that their personality traits are heritable. The text then states that Kathleen Morrill and colleagues undertook research about dog trait heritability and found that "behavior varies widely among dogs of the same breed." Because Morrill and colleagues found evidence for variability rather than consistency in the behavior of dogs of the same breed, the statement that research fails to uphold a commonly held belief about dog breeds and behavior accurately reflects the main idea of the text.

Choice A is incorrect. Although the text mentions that humans have long intervened in dogs' reproduction by intentionally crossbreeding certain dogs, it doesn't argue that such intervention is essential to the existence of dog breeds. *Choice C* is incorrect because the text doesn't discuss the popularity of any dog breeds; breeds are mentioned as having certain traits, but the text says nothing about the popularity of these breeds or traits. *Choice D* is incorrect. Although the text briefly mentions that Morrill and colleagues conducted a study about dog traits using both surveys and DNA sequencing, this is not the main focus of the text. The text concerns the study's results about the heritability of dog traits, not the particular methodology used by Morrill and colleagues.

QUESTION 12

Choice D is the best answer because it presents a statement about the site discovered by the researchers that is supported by the text. The text discusses Fiorelli and colleagues' discovery of egg clutches, single eggs, and eggshells in a Brazilian mine. According to the text, the presence of these eggs, which are from the Late Cretaceous period, led the researchers to conclude that the location was once a nesting and breeding site for titanosaurs. The text then explains that the finding is important because of the "previous lack of known nesting sites in northern regions of South America." If there haven't been any other discoveries of a nesting site in South America's northern regions and the site in the Brazilian mine is the first, then the text strongly suggests that the site is farther north than other nesting sites that have been discovered in South America.

Choice A is incorrect because the text doesn't suggest that the site discovered by Fiorelli and colleagues is the earliest titanosaur nesting and breeding site known to paleontologists but rather that it's the first nesting site found in northern regions of South America. Moreover, the text doesn't suggest how the timeline of the newly discovered site compares with that of other titanosaur nesting and

breeding sites. *Choice B* is incorrect because there is no mention in the text about any difficulties that Fiorelli and colleagues faced when they were excavating the nesting and breeding site in the Brazilian mine. *Choice C* is incorrect because the text doesn't support the idea that the nesting and breeding site in the Brazilian mine was occupied by sauropods other than titanosaurs. The text simply mentions that titanosaurs are sauropod dinosaurs and presents the researchers' conclusion that the site they discovered was for titanosaurs.

QUESTION 13

Choice A is the best answer because it most effectively uses data from the table to complete the example of the high cost and low popularity of world's fairs. The text presents Chow's argument that the United States hasn't hosted a world's fair since 1984 because people think these exhibitions are overly expensive and insufficiently popular. The text then cites the 1984 World's Fair as an example, noting that it cost $350 million. Since the example should illustrate both high cost and insufficient popularity, the best completion of the example is the information from the table that the 1984 World's Fair had 7.35 million visitors.

Choice B is incorrect because it misrepresents data from the table. The table indicates that the 1984 World's Fair, which is the world's fair used as an example in the text, had 7.35 million, not 9.60 million, visitors. *Choice C* is incorrect because it misrepresents data from the table. The table indicates that the 1984 World's Fair, which is the world's fair used as an example in the text, had 7.35 million, not 6.40 million, visitors. *Choice D* is incorrect because it misrepresents data from the table. The table indicates that the 1984 World's Fair, which is the world's fair used as an example in the text, had 7.35 million, not 5.60 million, visitors.

QUESTION 14

Choice C is the best answer because it most effectively uses data from the table to complete the statement. The table shows that on day 1, the menu for NASA's Gemini missions included sugar cookie cubes for meal B.

Choice A is incorrect because according to the table, shrimp cocktail was served on day 4, not day 1; moreover, the item was served for meal C, not meal B, as this choice claims. *Choice B* is incorrect because according to the table, hot cocoa was served on day 3, not on day 1; moreover, the item was served for meal A, not for meal C, as this choice claims. *Choice D* is incorrect because according to the table, chicken and vegetables were served on day 2, not on day 1; moreover, the item was served for meal B, not for meal A, as this choice claims.

QUESTION 15

Choice C is the best answer because it most effectively uses a quotation to illustrate the claim that Lady Gertrude Chiltern is perceived as "both extremely virtuous and unforgiving." In the quotation, a man describes Lady Chiltern as someone who "does not know what weakness or temptation is." In other words, the man regards her as someone who is strong and adheres to a strict definition of moral perfection. However, he ironically suggests that this definition excludes mercy and forgiveness—qualities that are also thought of as virtues; according to him, Lady Chiltern is "pitiless in her perfection—cold and stern and without mercy." This description supports the idea that Lady Chiltern is perceived by others as virtuous as well as unforgiving.

Choice A is incorrect. The quotation supports the claim that Lady Chiltern is perceived as virtuous, in that it describes her as "a woman of the very highest principles." However, it doesn't characterize her as unforgiving or being perceived as such. *Choice B* is incorrect. The quotation suggests that Lady Chiltern is concerned with morality, but it suggests that her interest in discussing it is fundamentally hypocritical and functions as a means by which to judge others. However, the quotation doesn't address the question of whether Lady Chiltern is unmerciful to those who seek forgiveness for harm they have caused. *Choice D* is incorrect because it doesn't address either Lady Chiltern's perceived virtuousness or her perceived lack of forgiveness; instead, it expresses the belief that she is sensible.

QUESTION 16

Choice A is the best answer because it most effectively uses data from the table to support the student's argument about the role of bufadienolide in the egg preferences of cane toad tadpoles. For each of five amphibian species included in the 2022 study, the table gives the percentage of available eggs that the cane toad tadpoles ate. According to the table, the tadpoles ate 10% of striped burrowing frog eggs and 1% of dainty green tree frog eggs, which suggests a preference for striped burrowing frog eggs over dainty green tree frog eggs. The table also indicates that neither of these species' eggs produces bufadienolide. Thus, these data suggest that something other than the presence or absence of bufadienolide is needed to adequately explain the tadpoles' egg preferences.

Choice B is incorrect. Although the table shows that for each of the five amphibian species, the cane toad tadpoles ate less than 100% of that species' eggs, which demonstrates that the tadpoles did indeed leave some eggs for each species unharmed, this fact alone is irrelevant to the tadpoles' preferences for some species' eggs over other species' eggs. *Choice C* is incorrect. Although the table indicates that the cane toad tadpoles ate 90% of the cane toad eggs and 7% of the short-footed frog eggs, which suggests that they prefer cane toad eggs over short-footed frog eggs, the table also indicates that cane toad eggs produce bufadienolide, whereas short-footed frog eggs do not. Therefore, these data are not sufficient to exclude that bufadienolide alone could explain the tadpoles'

preference for some species' eggs over other species' eggs. *Choice D* is incorrect. Although the table shows that for both dainty green tree frog eggs and little red tree frog eggs, the cane toad tadpoles ate 1% of those species' eggs, it also indicates that neither produces bufadienolide. Thus, these data alone don't indicate bufadienolide's role in the tadpoles' egg preferences.

QUESTION 17

Choice D is the best answer because it presents a finding that, if true, would support Asmerom and colleagues' conclusion that the ITCZ may have expanded northward and southward rather than shifting south during the Little Ice Age. The text indicates that the ITCZ, a band of clouds in the tropics that is a significant rainfall source, can change position. Data from Peru's Huagapo Cave suggest that the ITCZ shifted south during the Little Ice Age. But according to the text, if the ITCZ moved into South America in that way, then Central America should have been drier than climate models suggest it was. In other words, rainfall should have been reduced in Central America because the ITCZ, a significant rainfall source, had shifted into South America, but climate models do not show such a reduction in Central America. The text goes on to say that Asmerom and colleagues tried to resolve this apparent conflict by collecting data from Yok Balum cave in Central America and comparing them with data from Huagapo, which led the researchers to conclude that the ITCZ may have expanded both northward and southward rather than simply shifting south. If it is true that Yok Balum in Central America and Huagapo in South America show strongly correlated patterns of high rainfall during the Little Ice Age, such a finding would support Asmerom and colleagues' conclusion by suggesting that the two areas were affected by the same rainfall source, and thus that the ITCZ may have expanded rather than shifted.

Choice A is incorrect because there is no information in the text about how, if at all, the ITCZ affects temperature in areas where it is located. Rather, the text states that temperature variations across Earth's hemispheres can shift the position of the ITCZ. Finding that neither Yok Balum nor Huagapo data show evidence of significant local variations in temperature during the Little Ice Age would have no clear bearing on Asmerom and colleagues' claim. *Choice B* is incorrect because finding that both Yok Balum and Huagapo experienced prolonged dry conditions during the Little Ice Age would not support Asmerom and colleagues' conclusion that the ITCZ, a major source of rainfall, may have expanded northward and southward rather than simply shifting south. Dry conditions in both locations would suggest that the ITCZ did not cover either location. Additionally, finding that temperatures were elevated in both locations would have no clear bearing on Asmerom and colleagues' conclusion, since there is no information in the text that indicates how, if at all, the ITCZ affects temperature. *Choice C* is incorrect because finding that Yok Balum experienced prolonged dry conditions at the same time that Huagapo experienced high rainfall would weaken Asmerom and colleagues' conclusion, not strengthen it. Such a finding would suggest that the ITCZ shifted south and left Central America dry rather than expanding both northward and southward.

QUESTION 18

Choice A is the best answer because it most logically completes the text's discussion of potential benefits of interruptions in the workplace. The text indicates that a common belief in business is that interruptions to working employees decrease energy and productivity levels. However, the text goes on to explain that a research team led by Harshad Puranik has found that there could be a social benefit to these interruptions. Since the team found that workplace interruptions can increase employees' sense of belonging and job satisfaction, it follows that the interpersonal benefits of some interruptions can offset the perceived negative effects.

Choice B is incorrect. Although the text presents research findings that suggest some workplace interruptions can have a positive effect on employee job satisfaction, no further information is presented to suggest at what frequency these interruptions are ideal. Furthermore, the text doesn't tie workplace interruptions to increased productivity, but rather links it to social benefits such as sense of belonging. *Choice C* is incorrect because the text doesn't address employees' motives for choosing not to interrupt their colleagues. The text presents research findings that suggest that there are some positive interpersonal effects of workplace interruptions that can increase employee job satisfaction. *Choice D* is incorrect because asking businesses to discourage workplace interruptions doesn't follow from the team's research about the benefits of workplace interruptions, nor does the text describe an ideal work environment. Instead, the text presents research suggesting that there may be positive aspects to workplace interruptions that haven't previously been considered.

QUESTION 19

Choice C is the best answer. The convention being tested is the use of verbs to express tense in a sentence. In this choice, the present perfect tense verb "have contributed," used in conjunction with the phrase "since it began in 2012," correctly indicates that map editors have contributed in the past and continue to do so in the present.

Choice A is incorrect because the present tense verb "contribute" is inconsistent with the phrase "since it began in 2012," which suggests that the contributions occurred in the past and continue into the present. *Choice B* is incorrect because the future tense verb "will contribute" is inconsistent with the phrase "since it began in 2012," which suggests that the contributions occurred in the past and continue into the present. *Choice D* is incorrect because the future tense verb "will be contributing" is inconsistent with the phrase "since it began in 2012," which suggests that the contributions occurred in the past and continue into the present.

QUESTION 20

Choice C is the best answer. The convention being tested is pronoun-antecedent agreement. The plural pronoun "they" agrees in number with the plural antecedent "animals," which refers to tardigrades.

Choice A is incorrect because the singular pronoun "that" doesn't agree in number with the plural antecedent "animals." *Choice B* is incorrect because the singular pronoun "it" doesn't agree in number with the plural antecedent "animals." *Choice D* is incorrect because the singular pronoun "he" doesn't agree in number with the plural antecedent "animals."

QUESTION 21

Choice D is the best answer. The convention being tested is end-of-sentence punctuation. This choice correctly uses a question mark to punctuate the interrogative sentence "how are they able to move so fast?" The interrogative sentence asks a direct question, and the next sentence answers it.

Choice A is incorrect because the context requires an interrogative sentence. The exclamative sentence "how they are able to move so fast!" emphasizes the penguin's high rate of speed, but it doesn't set up the next sentence's explanation of how the penguins achieve such speeds. *Choice B* is incorrect because a period can't be used in this way to punctuate an interrogative sentence. *Choice C* is incorrect because the context requires an interrogative sentence. The exclamative sentence "how they are able to move so fast" emphasizes the penguin's high rate of speed, but it doesn't set up the next sentence's explanation of how the penguins achieve such speeds.

QUESTION 22

Choice C is the best answer. The convention being tested is punctuation between a supplementary phrase and a main clause. This choice correctly uses a comma to mark the boundary between the introductory supplementary phrase ("By linking the Hudson River to Lake Erie"), which identifies how the canal reduced transport time, and the main clause ("the canal reduced transport time to nine days and cut costs to six dollars per ton").

Choice A is incorrect because a semicolon can't be used in this way to mark the boundary between a supplementary phrase ("By…Erie") and the main clause ("the canal...ton"). *Choice B* is incorrect because an open parenthesis can't be used in this way to mark the boundary between a supplementary phrase ("By… Erie") and the main clause ("the canal...ton"). *Choice D* is incorrect because a colon can't be used in this way to mark the boundary between an introductory supplementary phrase ("By…Erie") and the main clause ("the canal...ton").

QUESTION 23

Choice A is the best answer. The convention being tested is punctuation between a subject and a verb. When, as in this case, a subject ("Generations of mystery and horror writers") is immediately followed by a verb ("have been influenced"), no punctuation is needed.

Choice B is incorrect because no punctuation is needed between the subject and the verb. *Choice C* is incorrect because no punctuation is needed between the subject and the verb. *Choice D* is incorrect because no punctuation is needed between the subject and the verb.

QUESTION 24

Choice D is the best answer. The convention being tested is subject-verb agreement. The singular verb "sweeps" agrees in number with the singular subject "she," which refers to Alice Coltrane.

Choice A is incorrect because the plural verb "sweep" doesn't agree in number with the singular subject "she." *Choice B* is incorrect because the plural verb "are sweeping" doesn't agree in number with the singular subject "she." *Choice C* is incorrect because the plural verb "were sweeping" doesn't agree in number with the singular subject "she."

QUESTION 25

Choice A is the best answer. The conventions being tested are the use of possessive determiners and plural nouns. The singular possessive determiner "its" and the plural noun "wings" correctly indicate that the butterfly has multiple wings.

Choice B is incorrect because the context requires the plural noun "wings," not the plural possessive noun "wings'." *Choice C* is incorrect because the context requires the singular possessive determiner "its" and the plural noun "wings," not the contraction "it's" and the singular possessive noun "wing's." *Choice D* is incorrect because the context requires the singular possessive determiner "its" and the plural noun "wings," not the contraction "it's" and the plural possessive noun "wings'."

QUESTION 26

Choice C is the best answer. The convention being tested is punctuation use between sentences. In this choice, the period is used correctly to mark the boundary between the first sentence ("On…temperature") and the second sentence ("Adding…effect"). The gerund phrase beginning with "adding" is the subject of the second sentence, and the verb phrase "helps combat this effect" describes what adding a light-colored covering can do.

Choice A is incorrect because a semicolon can't be used in this way to join the sentence "On…temperature" and the supplementary phrases that follow. Doing so leaves the verb phrase "helps combat" without a subject and thus results in a grammatically unconventional sentence. *Choice B* is incorrect because it results in a comma splice. A comma can't be used in this way to mark the boundary

between sentences. *Choice D* is incorrect. This choice results in a confusing and illogical sentence that suggests that adding a light-colored covering to an existing dark roof raises the temperature of the surrounding air. Furthermore, it creates ambiguity by leaving the verb phrase "helps combat" without a subject (so it isn't clear what helps combat the effect).

QUESTION 27

Choice D is the best answer. The convention being tested is punctuation use between a main clause and a supplementary phrase. This choice correctly uses a comma to mark the boundary between the main clause ("The haiku-like…writers") and the supplementary phrase ("among…Cole") that specifies a contemporary writer who has praised Tomas Tranströmer's haiku-like poems.

Choice A is incorrect because it results in a rhetorically unacceptable sentence fragment beginning with "among." *Choice B* is incorrect because it fails to mark the boundary between the main clause and the supplementary phrase with appropriate punctuation. *Choice C* is incorrect because a semicolon can't be used in this way to join the main clause ("The haiku-like…writers") and the supplementary phrase ("among…Cole").

QUESTION 28

Choice B is the best answer. "First" logically signals that the question in this sentence—whether there is a daily period during which jellyfish pulse rates decline—is the first in a sequence of three questions the researchers attempted to answer about jellyfish sleep behavior.

Choice A is incorrect because "as a result" illogically signals that the question in this sentence is a result of the three questions the researchers attempted to answer. Instead, it is the first of those three questions. *Choice C* is incorrect because "additionally" illogically signals that the question in this sentence is an additional question related to the three questions the researchers attempted to answer. Instead, it is the first of those three questions. *Choice D* is incorrect because "however" illogically signals that the question in this sentence contrasts with the three questions the researchers attempted to answer. Instead, it is the first of those three questions.

QUESTION 29

Choice C is the best answer. "Indeed" logically signals that the information in this sentence—that Laleh Mehran's installation resembled both a typical movie theater and a coal mine—supports the previous sentence's claim that the space Mehran created felt both "familiar and distant."

Choice A is incorrect because "next" illogically signals that the description of Laleh Mehran's installation in this sentence is the next step in a process. Rather, it supports the previous sentence's claim about Mehran's installation. *Choice B* is incorrect because "nevertheless" illogically signals that the information in this sentence is true despite the claim about Laleh Mehran's installation in the previous sentence. Rather, it supports that claim. *Choice D* is incorrect because "instead" illogically signals that this sentence presents an alternative to the previous sentence's claim about Laleh Mehran's installation. Rather, it supports that claim.

QUESTION 30

Choice B is the best answer. "In contrast" logically signals that the information in this sentence—that ABA triggers accelerated growth in the mustard plant *Schrenkiella parvula*—contrasts with the previous information about ABA triggering a slowdown in most plants' biological processes.

Choice A is incorrect because "moreover" illogically signals that the information in this sentence about the mustard plant merely adds to the previous information about the effects of ABA. Instead, it contrasts with that information. *Choice C* is incorrect because "for example" illogically signals that the information in this sentence about the mustard plant provides an example consistent with the previous information about the effects of ABA. Instead, it contrasts with that information. *Choice D* is incorrect because "thus" illogically signals that the information in this sentence about the mustard plant is a consequence, or result, of the previous information about the effects of ABA. Instead, it contrasts with that information.

QUESTION 31

Choice D is the best answer. "For instance" logically signals that the details in this sentence—that Mexican conductor Alondra de la Parra and Colombian conductor Lina Gonzalez-Granados took new conducting positions—are examples supporting the previous claim about the new generation of artists.

Choice A is incorrect because "in addition" illogically signals that the details in this sentence about de la Parra and Gonzalez-Granados are merely additional facts related to the previous claim about the new generation of artists. Instead, they are examples supporting that claim. *Choice B* is incorrect because "lastly" illogically signals that the details in this sentence about de la Parra and Gonzalez-Granados are the last step or a concluding summary of the previous claim about the new generation of artists. Instead, they are examples supporting that claim. *Choice C* is incorrect because "granted" illogically signals that the details in this sentence about de la Parra and Gonzalez-Granados are exceptions to the previous claim about the new generation of artists. Instead, they are examples supporting that claim.

QUESTION 32

Choice D is the best answer. The sentence emphasizes a difference between C-type and S-type asteroids, noting that C-type asteroids are mainly composed of carbon, while S-type asteroids are mainly composed of silicate minerals.

Choice A is incorrect. The sentence states that C-type and S-type are two types of asteroids, but it doesn't emphasize a difference between them. *Choice B* is incorrect because it doesn't directly mention C-type or S-type asteroids. *Choice C* is incorrect. While the sentence mentions that 17 percent of known asteroids are S-type asteroids, it doesn't identify the percentage of asteroids that are C-type. Therefore, the sentence doesn't emphasize a difference between the two types.

QUESTION 33

Choice C is the best answer. The sentence provides an overview of the matsutake commodity chain, connecting the Oregon mushroom pickers at one end to the Japanese consumers at the other.

Choice A is incorrect. While the sentence mentions the matsutake commodity chain, it focuses only on its origins; it does not provide an overview. *Choice B* is incorrect. The sentence provides a general definition of commodity chains, not an overview of the matsutake chain. *Choice D* is incorrect. While the sentence mentions the matsutake commodity chain, it focuses only on one end of the chain (the consumers); it does not provide an overview.

Math

Module 1
(27 questions)

QUESTION 1

Choice C is correct. It's given that 3 teaspoons is equivalent to 1 tablespoon. Therefore, 44 tablespoons is equivalent to $\left(44 \text{ tablespoons}\right)\left(\frac{3 \text{ teaspoons}}{1 \text{ tablespoon}}\right)$, or 132 teaspoons.

Choice A is incorrect. This is equivalent to approximately 15.66 tablespoons, not 44 tablespoons. *Choice B* is incorrect. This is equivalent to approximately 29.33 tablespoons, not 44 tablespoons. *Choice D* is incorrect. This is equivalent to approximately 58.66 tablespoons, not 44 tablespoons.

QUESTION 2

Choice D is correct. It's given that $f\left(x\right)=\frac{1}{6x}$. Substituting 3 for x in this equation yields $f\left(3\right)=\frac{1}{6\left(3\right)}$, or $f\left(3\right)=\frac{1}{18}$. Therefore, when $x=3$, the value of $f\left(x\right)$ is $\frac{1}{18}$.

Choice A is incorrect. This is the value of $f\left(x\right)$ when $x=0.5$. *Choice B* is incorrect. This is the value of $f\left(x\right)$ when $x=1$. *Choice C* is incorrect. This is the value of $f\left(x\right)$ when $x=1.5$.

QUESTION 3

Choice C is correct. It's given that $x=40$. Adding 6 to both sides of this equation yields $x+6=40+6$, or $x+6=46$. Therefore, the value of $x+6$ is 46.

Choice A is incorrect. This is the value of $x-6$, not $x+6$. *Choice B* is incorrect. This is the value of x, not $x+6$. *Choice D* is incorrect. This is the value of $x+24$, not $x+6$.

QUESTION 4

Choice A is correct. 23% of 100 can be calculated by multiplying $\frac{23}{100}$ by 100, which yields $\left(\frac{23}{100}\right)100$, or 23.

Choice B is incorrect. This is 46%, not 23%, of 100. *Choice C* is incorrect. This is 23% less than 100, not 23% of 100. *Choice D* is incorrect. This is 23% greater than 100, not 23% of 100.

QUESTION 5

Choice D is correct. The given expression shows addition of two like terms. Therefore, the given expression is equivalent to $(50+5)x^2$, or $55x^2$.

Choice A is incorrect. This expression is equivalent to $(50)(5)x^2$, not $(50+5)x^2$.

Choice B is incorrect. This expression is equivalent to $\left(\frac{50}{5}\right)x^2$, not $(50+5)x^2$.

Choice C is incorrect. This expression is equivalent to $(50-5)x^2$, not $(50+5)x^2$.

QUESTION 6

The correct answer is 370. It's given that the population density of Cedar County is 230 people per square mile and the county has a population of 85,100 people. Based on the population density, it follows that the area of Cedar County is $\left(85{,}100 \text{ people}\right)\left(\frac{1 \text{ square mile}}{230 \text{ people}}\right)$, or 370 square miles.

QUESTION 7

The correct answer is -9. Since w is in the denominator of a fraction in the given equation, w can't be equal to 0. Since w isn't equal to 0, multiplying both sides of the given equation by w yields an equivalent equation, $-54=6w$. Dividing both sides of this equation by 6 yields $-9=w$. Therefore, -9 is the solution to the given equation.

QUESTION 8

Choice B is correct. An equation defining a linear function can be written in the form $f(x)=mx+b$, where m and b are constants, m is the slope of the graph of $y=f(x)$ in the xy-plane, and $(0, b)$ is the y-intercept of the graph. It's given that for the function f, the graph of $y=f(x)$ in the xy-plane has a slope of 3. Therefore, $m=3$. It's also given that this graph passes through the point $(0, -8)$. Therefore, the y-intercept of the graph is $(0, -8)$, and it follows that $b=-8$. Substituting 3 for m and -8 for b in the equation $f(x)=mx+b$ yields $f(x)=3x-8$. Thus, the equation that defines f is $f(x)=3x-8$.

Choice A is incorrect. For this function, the graph of $y=f(x)$ in the xy-plane passes through the point $(0, 0)$, not $(0, -8)$. *Choice C* is incorrect. For this function, the graph of $y=f(x)$ in the xy-plane passes through the point $(0, 5)$, not $(0, -8)$. *Choice D* is incorrect. For this function, the graph of $y=f(x)$ in the xy-plane passes through the point $(0, 11)$, not $(0, -8)$.

QUESTION 9

Choice A is correct. The perimeter of a triangle is the sum of the lengths of its three sides. The triangle shown has side lengths x, y, and z. It's given that the triangle has a perimeter of 22 units. Therefore, $x + y + z = 22$. If $x = 9$ units and $y = 7$ units, the value of z, in units, can be found by substituting 9 for x and 7 for y in the equation $x + y + z = 22$, which yields $9 + 7 + z = 22$, or $16 + z = 22$. Subtracting 16 from both sides of this equation yields $z = 6$. Therefore, if $x = 9$ units and $y = 7$ units, the value of z, in units, is 6.

Choice B is incorrect. This is the value of y, in units, not the value of z, in units.
Choice C is incorrect. This is the value of x, in units, not the value of z, in units.
Choice D is incorrect. This is the value of $x + y$, in units, not the value of z, in units.

QUESTION 10

Choice A is correct. The value of $h(-2)$ can be found by substituting -2 for x in the equation defining h. Substituting -2 for x in $h(x) = 3x - 7$ yields $h(-2) = 3(-2) - 7$, or $h(-2) = -13$. Therefore, the value of $h(-2)$ is -13.

Choice B is incorrect. This is the value of $h(-1)$, not $h(-2)$. *Choice C* is incorrect and may result from conceptual or calculation errors. *Choice D* is incorrect and may result from conceptual or calculation errors.

QUESTION 11

Choice C is correct. The tangent of an acute angle in a right triangle is defined as the ratio of the length of the side opposite the angle to the length of the shorter side adjacent to the angle. In the triangle shown, the length of the side opposite the angle with measure $x°$ is 26 units and the length of the side adjacent to the angle with measure $x°$ is 7 units. Therefore, the value of $\tan x°$ is $\frac{26}{7}$.

Choice A is incorrect and may result from conceptual or calculation errors.
Choice B is incorrect and may result from conceptual or calculation errors.
Choice D is incorrect and may result from conceptual or calculation errors.

QUESTION 12

Choice C is correct. It's given that the scatterplot shows the relationship between two variables, x and y, and a line of best fit is shown. For the line of best fit shown, for each increase in the value of x by 1, the corresponding value of y increases by a constant rate. It follows that the relationship between the variables x and y has a positive linear trend. A line in the xy-plane that passes through the points (a, b) and (c, d) has a slope of $\frac{d-b}{c-a}$. The line of best fit shown passes approximately through the points $(0, 0.25)$ and $(4, 2)$. It follows that the slope of this line is approximately $\frac{2-0.25}{4-0}$, which is equivalent to 0.4375. Therefore, of the given choices, 0.44 is closest to the slope of the line of best fit shown.

Choice A is incorrect. This is the slope of a line of best fit for a relationship between x and y that has a negative, rather than a positive, linear trend. *Choice B*

is incorrect. This is the slope of a line of best fit for a relationship between x and y that has a negative, rather than a positive, linear trend. *Choice D* is incorrect and may result from conceptual or calculation errors.

QUESTION 13

The correct answer is 9. It's given that the *y*-intercept of the graph of $12x + 2y = 18$ in the *xy*-plane is $(0, y)$. Substituting 0 for x in the equation $12x + 2y = 18$ yields $12(0) + 2y = 18$, or $2y = 18$. Dividing both sides of this equation by 2 yields $y = 9$. Therefore, the value of y is 9.

QUESTION 14

The correct answer is 241. For a certain animal, it's given that a model predicts the animal weighed 241 pounds when it was born and gained 3 pounds per day in its first year of life. It's also given that this model is defined by an equation in the form $f(x) = a + bx$, where $f(x)$ is the predicted weight, in pounds, of the animal x days after it was born, and a and b are constants. It follows that a represents the predicted weight, in pounds, of the animal when it was born and b represents the predicted rate of weight gain, in pounds per day, in its first year of life. Thus, the value of a is 241.

QUESTION 15

Choice A is correct. It's given that the graph shows the height above ground, in meters, of a ball x seconds after the ball was launched upward from a platform. In the graph shown, the *x*-axis represents time, in seconds, and the *y*-axis represents the height of the ball above ground, in meters. It follows that for the marked point $(1.0, 4.8)$, 1.00 represents the time, in seconds, after the ball was launched upward from a platform and 4.80 represents the height of the ball above ground, in meters. Therefore, the best interpretation of the marked point $(1.0, 4.8)$ is 1.00 second after being launched, the ball's height above ground is 4.80 meters.

Choice B is incorrect and may result from conceptual errors. *Choice C* is incorrect and may result from conceptual errors. *Choice D* is incorrect and may result from conceptual errors.

QUESTION 16

Choice A is correct. It's given that based on a random sample from a population, the estimated mean value for a certain variable for the population is 20.5, with an associated margin of error of 1. This means that it is plausible that the actual mean value of the variable for the population is between $20.5 - 1$ and $20.5 + 1$. Therefore, the most appropriate conclusion is that it is plausible that the actual mean value of the variable for the population is between 19.5 and 21.5.

Choice B is incorrect. The estimated mean value and associated margin of error describe only plausible values, not all the possible values, for the actual mean value of the variable, so this is not an appropriate conclusion. *Choice C* is

incorrect. The estimated mean value and associated margin of error describe only plausible values for the actual mean value of the variable, not all the possible values of the variable, so this is not an appropriate conclusion. *Choice D* is incorrect. Since 20.5 is the estimated mean value of the variable based on a random sample, the actual mean value of the variable may not be exactly 20.5. Therefore, this is not an appropriate conclusion.

QUESTION 17

Choice B is correct. It's given that the equation $7m = 5(n+p)$ relates the positive numbers m, n, and p. Dividing both sides of the given equation by 5 yields $\frac{7m}{5} = n+p$. Subtracting p from both sides of this equation yields $\frac{7m}{5} - p = n$, or $n = \frac{7m}{5} - p$. It follows that the equation $n = \frac{7m}{5} - p$ correctly gives n in terms of m and p.

Choice A is incorrect and may result from conceptual or calculation errors. *Choice C* is incorrect and may result from conceptual or calculation errors. *Choice D* is incorrect and may result from conceptual or calculation errors.

QUESTION 18

Choice A is correct. It's given that a rectangle has a length that is 15 times its width. It's also given that the function $y = (15w)(w)$ represents this situation, where y is the area, in square feet, of the rectangle and $y > 0$. The area of a rectangle can be calculated by multiplying the rectangle's length by its width. Since the rectangle has a length that is 15 times its width, it follows that w represents the width of the rectangle, in feet, and $15w$ represents the length of the rectangle, in feet. Therefore, the best interpretation of $15w$ in this context is that it's the length of the rectangle, in feet.

Choice B is incorrect. This is the best interpretation of y, not $15w$, in the given function. *Choice C* is incorrect and may result from conceptual errors. *Choice D* is incorrect. This is the best interpretation of w, not $15w$, in the given function.

QUESTION 19

Choice B is correct. Adding the first equation to the second equation in the given system yields $(x+2y)+(x-2y)=6+4$, or $(x+x)+(2y-2y)=10$. Combining like terms in this equation yields $2x=10$. Dividing both sides of this equation by 2 yields $x=5$. Thus, the value of x is 5.

Choice A is incorrect and may result from conceptual or calculation errors. *Choice C* is incorrect and may result from conceptual or calculation errors. *Choice D* is incorrect. This is the value of $2x$, not x.

QUESTION 20

The correct answer is 19. The minimum value of a data set is the least value in the data set. The frequency refers to the number of times a value occurs. The given table shows that for this data set, the value 19 occurs 7 times, the value 21 occurs 1 time, the value 23 occurs 7 times, and the value 25 occurs 4 times. Therefore, of the values 19, 21, 23, and 25 given in the data set, the minimum value of the data set is 19.

QUESTION 21

The correct answer is -2. It's given that a number x is at most 17 less than 5 times the value of y, or $x \leq 5y - 17$. Substituting 3 for y in this inequality yields $x \leq 5(3) - 17$, or $x \leq -2$. Thus, if the value of y is 3, the greatest possible value of x is -2.

QUESTION 22

Choice C is correct. The left-hand side of the given equation can be factored as $(5x + 3)(x - 8)$. Therefore, the given equation, $5x^2 - 37x - 24 = 0$, can be written as $(5x + 3)(x - 8) = 0$. Applying the zero product property to this equation yields $5x + 3 = 0$ and $x - 8 = 0$. Subtracting 3 from both sides of the equation $5x + 3 = 0$ yields $5x = -3$. Dividing both sides of this equation by 5 yields $x = -\frac{3}{5}$. Adding 8 to both sides of the equation $x - 8 = 0$ yields $x = 8$. Therefore, the two solutions to the given equation, $5x^2 - 37x - 24 = 0$, are $-\frac{3}{5}$ and 8. It follows that 8 is the positive solution to the given equation.

Choice A is incorrect and may result from conceptual or calculation errors.
Choice B is incorrect and may result from conceptual or calculation errors.
Choice D is incorrect and may result from conceptual or calculation errors.

QUESTION 23

Choice B is correct. In the figure shown, the angle measuring $y°$ is congruent to its vertical angle formed by lines s and m, so the measure of the vertical angle is also $y°$. The vertical angle forms a same-side interior angle pair with the angle measuring $x°$. It's given that lines r and s are parallel. Therefore, same-side interior angles in the figure are supplementary, which means the sum of the measure of the vertical angle and the measure of the angle measuring $x°$ is 180°, or $x + y = 180$. Subtracting x from both sides of this equation yields $y = 180 - x$. Substituting $180 - x$ for y in the inequality $y < 65$ yields $180 - x < 65$. Adding x to both sides of this inequality yields $180 < 65 + x$. Subtracting 65 from both sides of this inequality yields $115 < x$, or $x > 115$. Thus, if $y < 65$, it must be true that $x > 115$.

Choice A is incorrect and may result from conceptual or calculation errors. *Choice C* is incorrect. $x + y$ must be equal to, not less than, 180. *Choice D* is incorrect. $x + y$ must be equal to, not greater than, 180.

QUESTION 24

Choice B is correct. It's given that the graph of $y = g(x)$ is produced by translating the graph of $y = f(x)$ 3 units down and 4 units to the right in the xy-plane. Therefore, function g can be defined by an equation in the form $g(x) = f(x-4) - 3$. Function f is defined by the equation $f(x) = \frac{a-19}{x} + 5$, where a is a constant. Substituting $x-4$ for x in the equation $f(x) = \frac{a-19}{x} + 5$ yields $f(x-4) = \frac{a-19}{x-4} + 5$. Substituting $\frac{a-19}{x-4} + 5$ for $f(x-4)$ in the equation $g(x) = f(x-4) - 3$ yields $g(x) = \frac{a-19}{x-4} + 5 - 3$, or $g(x) = \frac{a-19}{x-4} + 2$. Therefore, the equation that defines function g is $g(x) = \frac{a-19}{x-4} + 2$.

Choice A is incorrect. This equation defines a function whose graph is produced by translating the graph of $y = f(x)$ 3 units down and 4 units to the left, not 3 units down and 4 units to the right. *Choice C* is incorrect. This equation defines a function whose graph is produced by translating the graph of $y = f(x)$ 4 units to the left, not 3 units down and 4 units to the right. *Choice D* is incorrect. This equation defines a function whose graph is produced by translating the graph of $y = f(x)$ 4 units to the right, not 3 units down and 4 units to the right.

QUESTION 25

Choice D is correct. An equation representing the height above ground h, in meters, of a softball t seconds after it is launched by a machine from ground level can be written in the form $h = -a(t-b)^2 + c$, where a, b, and c are positive constants. In this equation, b represents the time, in seconds, at which the softball reaches its maximum height of c meters above the ground. It's given that this softball reaches a maximum height of 51.84 meters above the ground at 1.8 seconds; therefore, $b = 1.8$ and $c = 51.84$. Substituting 1.8 for b and 51.84 for c in the equation $h = -a(t-b)^2 + c$ yields $h = -a(t-1.8)^2 + 51.84$. It's also given that this softball hits the ground at 3.6 seconds; therefore, $h = 0$ when $t = 3.6$. Substituting 0 for h and 3.6 for t in the equation $h = -a(t-1.8)^2 + 51.84$ yields $0 = -a(3.6-1.8)^2 + 51.84$, which is equivalent to $0 = -a(1.8)^2 + 51.84$, or $0 = -3.24a + 51.84$. Adding 3.24a to both sides of this equation yields $3.24a = 51.84$. Dividing both sides of this equation by 3.24 yields $a = 16$. Substituting 16 for a in the equation $h = -a(t-1.8)^2 + 51.84$ yields $h = -16(t-1.8)^2 + 51.84$. Therefore, $h = -16(t-1.8)^2 + 51.84$ represents the height above ground h, in meters, of this softball t seconds after it is launched.

Choice A is incorrect. This equation represents a situation where the maximum height is 3.6 meters above the ground at 0 seconds, not 51.84 meters above the ground at 1.8 seconds. *Choice B* is incorrect. This equation represents a situation where the maximum height is 51.84 meters above the ground at 0 seconds, not 1.8 seconds. *Choice C* is incorrect and may result from conceptual or calculation errors.

QUESTION 26

Choice D is correct. It's given that in triangle ABC, the measure of angle B is $90°$ and BD is an altitude of the triangle. Therefore, the measure of angle BDC is $90°$. It follows that angle B is congruent to angle D and angle C is congruent to angle C. By the angle-angle similarity postulate, triangle ABC is similar to triangle BDC. Since triangles ABC and BDC are similar, it follows that $\frac{AC}{AB} = \frac{BC}{BD}$. It's also given that the length of $\overline{AB}$ is 15 and the length of $\overline{AC}$ is 23 greater than the length of $\overline{AB}$. Therefore, the length of $\overline{AC}$ is $15+23$, or 38. Substituting 15 for AB and 38 for AC in the equation $\frac{AC}{AB} = \frac{BC}{BD}$ yields $\frac{38}{15} = \frac{BC}{BD}$. Therefore, the value of $\frac{BC}{BD}$ is $\frac{38}{15}$.

Choice A is incorrect. This is the value of $\frac{BD}{BC}$. *Choice B* is incorrect and may result from conceptual or calculation errors. *Choice C* is incorrect and may result from conceptual or calculation errors.

QUESTION 27

The correct answer is -7. For a quadratic function defined by an equation of the form $f(x) = a(x-h)^2 + k$, where a, h, and k are constants and $a > 0$, the function reaches its minimum when $x = h$. In the given function, $a = 1$, $h = -7$, and $k = 4$. Therefore, the value of x for which $f(x)$ reaches its minimum is -7.

Math
Module 2
(27 questions)

QUESTION 1

Choice C is correct. The median of a data set represented in a box plot is given by the vertical line within the box. In the given box plot, the vertical line within the box occurs at 5. Therefore, the median of this data set is 5.

Choice A is incorrect. This is the minimum value of the data set. *Choice B* is incorrect and may result from conceptual errors. *Choice D* is incorrect. This is the maximum value of the data set.

QUESTION 2

Choice D is correct. The *x*-intercept of the graph shown is the point (x, y) on the graph where $y = 0$. At $y = 0$, the corresponding value of x is 4. Therefore, the *x*-intercept of the graph shown is $(4, 0)$.

Choice A is incorrect. This is the *x*-intercept of a graph in the *xy*-plane that intersects the *x*-axis at $x = -5$, not $x = 4$. *Choice B* is incorrect. This is the *x*-intercept of a graph in the *xy*-plane that intersects the *x*-axis at $x = 5$, not $x = 4$. *Choice C* is incorrect. This is the *x*-intercept of a graph in the *xy*-plane that intersects the *x*-axis at $x = -4$, not $x = 4$.

QUESTION 3

Choice B is correct. It's given that Henry uses his $60.00 gift card to buy 3 movies for $7.50 each. Therefore, Henry spends $3($7.50$)$, or $22.50, of his $60.00 gift card to buy 3 movies. After buying 3 movies with his $60.00 gift card, Henry has a gift card balance of $60.00 − $22.50, or $37.50. It's also given that Henry spends the rest of his gift card balance on renting movies for $1.50 each. Therefore, Henry can rent $\frac{\$37.50}{\$1.50}$, or 25, movies.

Choice A is incorrect and may result from conceptual or calculation errors. *Choice C* is incorrect and may result from conceptual or calculation errors. *Choice D* is incorrect and may result from conceptual or calculation errors.

QUESTION 4

Choice A is correct. It's given that the graphs of the given equations intersect at the point (x, y) in the xy-plane. It follows that (x, y) represents a solution to the system consisting of the given equations. The first equation given is $x = 49$. Substituting 49 for x in the second equation given, $y = \sqrt{x} + 9$, yields $y = \sqrt{49} + 9$, which is equivalent to $y = 7 + 9$, or $y = 16$. It follows that the graphs of the given equations intersect at the point $(49, 16)$. Therefore, the value of y is 16.

Choice B is incorrect and may result from conceptual or calculation errors.
Choice C is incorrect and may result from conceptual or calculation errors.
Choice D is incorrect and may result from conceptual or calculation errors.

QUESTION 5

Choice C is correct. It's given that the cherry pitting machine pits 12 pounds of cherries in 3 minutes. This rate can be written as $\frac{12 \text{ pounds of cherries}}{3 \text{ minutes}}$. If the number of minutes it takes the machine to pit 96 pounds of cherries is represented by x, the value of x can be calculated by solving the equation $\frac{12 \text{ pounds of cherries}}{3 \text{ minutes}} = \frac{96 \text{ pounds of cherries}}{x \text{ minutes}}$, which can be rewritten as $\frac{12}{3} = \frac{96}{x}$, or $4 = \frac{96}{x}$. Multiplying each side of this equation by x yields $4x = 96$. Dividing each side of this equation by 4 yields $x = 24$. Therefore, it takes the machine 24 minutes to pit 96 pounds of cherries.

Choice A is incorrect. This is the number of minutes it takes the machine to pit 32, not 96, pounds of cherries. *Choice B* is incorrect. This is the number of minutes it takes the machine to pit 60, not 96, pounds of cherries. *Choice D* is incorrect. This is the number of minutes it takes the machine to pit 144, not 96, pounds of cherries.

QUESTION 6

The correct answer is 54. Dividing both sides of the given equation by 2 yields $x = 6$. Multiplying both sides of this equation by 9 yields $9x = 54$. Thus, the value of $9x$ is 54.

QUESTION 7

The correct answer is $\frac{1}{4}$. It's given that line k is defined by $y = \frac{1}{4}x + 1$. It's also given that line j is parallel to line k in the xy-plane. A line in the xy-plane represented by an equation in slope-intercept form $y = mx + b$ has a slope of m and a y-intercept of $(0, b)$. Therefore, the slope of line k is $\frac{1}{4}$. Since parallel lines have equal slopes, the slope of line j is $\frac{1}{4}$. Note that 1/4 and .25 are examples of ways to enter a correct answer.

QUESTION 8

Choice B is correct. If a data set contains an odd number of data values, the median is represented by the middle data value in the list when the data values are listed in ascending or descending order. Since the data set shown has 7 data values and is in ascending order, it follows that the median is the fourth data value in the list, or 8. If a data set contains an even number of data values, the median is between the two middle data values when the values are listed in ascending or descending order. Since each of the choices consists of a data set with 6 data values in ascending order, it follows that the median is between the third and fourth data value. The third and fourth data values in choice B are 8 and 8. Thus, choice B represents a data set with a median of 8. Since the median of the data set shown is 8 and choice B represents a data set with a median of 8, it follows that choice B represents a data set that has the same median as the data set shown.

Choice A is incorrect. This list represents a data set with a median of 6, not 8.
Choice C is incorrect. This list represents a data set with a median of 10, not 8.
Choice D is incorrect. This list represents a data set with a median of 10, not 8.

QUESTION 9

Choice D is correct. It's given that the length of the base of the parallelogram is 89% of the height of the parallelogram. Since h is the height of the parallelogram, it follows that the length of the base of the parallelogram can be represented by the expression $\frac{89}{100}h$, or $0.89h$.

Choice A is incorrect. This expression represents 8,900%, not 89%, of the height of the parallelogram. *Choice B* is incorrect. This expression represents 8.9%, not 89%, of the height of the parallelogram. *Choice C* is incorrect. This expression represents 890%, not 89%, of the height of the parallelogram.

QUESTION 10

Choice A is correct. It's given that for a camping trip a group bought x one-liter bottles of water and y three-liter bottles of water. Since the group bought x one-liter bottles of water, the total number of liters bought from x one-liter bottles of water is represented as $1x$, or x. Since the group bought y three-liter bottles of water, the total number of liters bought from y three-liter bottles of water is represented as $3y$. It's given that the group bought a total of 240 liters; thus, the equation $x + 3y = 240$ represents this situation.

Choice B is incorrect and may result from conceptual errors. *Choice C* is incorrect and may result from conceptual errors. *Choice D* is incorrect. This equation represents a situation where the group bought x three-liter bottles of water and y one-liter bottles of water, for a total of 240 liters of water.

QUESTION 11

Choice C is correct. Each of the given choices gives three values of x: 0, 1, and 2. Substituting 0 for x in the given equation yields $y = -4(0) + 40$, or $y = 40$.

Therefore, when $x = 0$, the corresponding value of y for the given equation is 40. Substituting 1 for x in the given equation yields $y = -4(1) + 40$, or $y = 36$. Therefore, when $x = 1$, the corresponding value of y for the given equation is 36. Substituting 2 for x in the given equation yields $y = -4(2) + 40$, or $y = 32$. Therefore, when $x = 2$, the corresponding value of y for the given equation is 32. Choice C gives three values of x, 0, 1, and 2, and their corresponding values of y, 40, 36, and 32, respectively, for the given equation.

Choice A is incorrect. This table gives three values of x and their corresponding values of y for the equation $y = -4x$. *Choice B* is incorrect. This table gives three values of x and their corresponding values of y for the equation $y = 4x + 40$. *Choice D* is incorrect. This table gives three values of x and their corresponding values of y for the equation $y = 4x$.

QUESTION 12

Choice D is correct. Since the shaded region shown represents solutions to an inequality, an ordered pair (x, y) is a solution to the inequality if it's represented by a point in the shaded region. Of the given choices, only $(4, 0)$ is represented by a point in the shaded region. Therefore, $(4, 0)$ is a solution to the inequality.

Choice A is incorrect and may result from conceptual errors. *Choice B* is incorrect and may result from conceptual errors. *Choice C* is incorrect and may result from conceptual errors.

QUESTION 13

The correct answer is 84. The sum of the measures of the interior angles of a triangle is 180°. It's given that in triangle *JKL*, the measures of $\angle K$ and $\angle L$ are each 48°. Adding the measures, in degrees, of $\angle K$ and $\angle L$ gives $48 + 48$, or 96. Therefore, the measure of $\angle J$, in degrees, is $180 - 96$, or 84.

QUESTION 14

The correct answer is 99. In the given system of equations, the second equation is $x + 8 = 11$. Subtracting 8 from both sides of this equation yields $x = 3$. In the given system of equations, the first equation is $y = x^2 + 14x + 48$. Substituting 3 for x in this equation yields $y = (3)^2 + 14(3) + 48$, or $y = 99$. Therefore, the solution to the given system of equations is $(x, y) = (3, 99)$. Thus, the value of y is 99.

QUESTION 15

Choice A is correct. It's given that the cleaning service cleans both offices and homes, where f is the number of offices and h is the number of homes the cleaning service can clean per day. Therefore, the expression $f + h$ represents the number of places the cleaning service can clean per day. It's also given that the cleaning service can clean at most 14 places per day. Since $f + h$ represents the number of places the cleaning service can clean per day and the service can clean at most 14 places per day, it follows that the inequality $f + h \leq 14$ represents this situation.

Choice B is incorrect. This inequality represents a cleaning service that cleans at least 14 places per day. *Choice C* is incorrect. This inequality represents a cleaning service that cleans at most 14 more offices than homes per day. *Choice D* is incorrect. This inequality represents a cleaning service that cleans at least 14 more offices than homes per day.

QUESTION 16

Choice A is correct. Since 2 is a common factor of each of the terms in the given expression, the expression can be rewritten as $2(x^2 + 19x + 5)$. Therefore, the factors of the given expression are 2 and $x^2 + 19x + 5$. Of these two factors, only 2 is listed as a choice.

Choice B is incorrect and may result from conceptual or calculation errors. *Choice C* is incorrect. This is a term of the given expression, not a factor of the given expression. *Choice D* is incorrect. This is a term of the given expression, not a factor of the given expression.

QUESTION 17

Choice B is correct. It's given that the equation $40x + 20y = 160$ represents the number of sweaters, x, and the number of shirts, y, that Yesenia purchased for $160. If Yesenia purchased 2 sweaters, the number of shirts she purchased can be calculated by substituting 2 for x in the given equation, which yields $40(2) + 20y = 160$, or $80 + 20y = 160$. Subtracting 80 from both sides of this equation yields $20y = 80$. Dividing both sides of this equation by 20 yields $y = 4$. Therefore, if Yesenia purchased 2 sweaters, she purchased 4 shirts.

Choice A is incorrect and may result from conceptual or calculation errors. *Choice C* is incorrect. This is the number of shirts Yesenia purchased if she purchased 0 sweaters. *Choice D* is incorrect. This is the price, in dollars, for each sweater, not the number of shirts Yesenia purchased.

QUESTION 18

Choice C is correct. In the given equation, x represents the number of days after a new product launched, where $0 \leq x \leq 20$, and y represents the estimated stock price, in dollars, for a certain company. Therefore, the best interpretation of $(x, y) = (1, 83)$ in this context is that 1 day after the new product launched, the company's estimated stock price is $83.

Choice A is incorrect and may result from conceptual errors. *Choice B* is incorrect and may result from conceptual errors. *Choice D* is incorrect and may result from conceptual errors.

QUESTION 19

Choice B is correct. For the given linear function f, $f(x)$ must equal 39 for all values of x. Of the given choices, only choice B gives three values of x and their corresponding values of $f(x)$ for the given linear function f.

Choice A is incorrect and may result from conceptual errors. *Choice C* is incorrect and may result from conceptual errors. *Choice D* is incorrect and may result from conceptual errors.

QUESTION 20

The correct answer is 27. It's given that a triangular prism has a volume of 216 cubic centimeters (cm^3) and the volume of a triangular prism is equal to Bh, where B is the area of the base and h is the height of the prism. Therefore, $216 = Bh$. It's also given that the triangular prism has a height of 8 cm. Therefore, $h = 8$. Substituting 8 for h in the equation $216 = Bh$ yields $216 = B(8)$. Dividing both sides of this equation by 8 yields $27 = B$. Therefore, the area, in cm², of the base of the prism is 27.

QUESTION 21

The correct answer is $\frac{1}{2}$. For the graph shown, x represents time, in seconds, and y represents momentum, in newton-seconds. Therefore, the average rate of change, in newton-seconds per second, in the momentum of the object between two *x*-values is the difference in the corresponding *y*-values divided by the difference in the *x*-values. The graph shows that at $x = 2$, the corresponding *y*-value is 6. The graph also shows that at $x = 6$, the corresponding *y*-value is 8. It follows that the average rate of change, in newton-seconds per second, from $x = 2$ to $x = 6$ is $\frac{8-6}{6-2}$, which is equivalent to $\frac{2}{4}$, or $\frac{1}{2}$. Note that 1/2 and .5 are examples of ways to enter a correct answer.

QUESTION 22

Choice C is correct. It's given that the system has infinitely many solutions. A system of two linear equations has infinitely many solutions when the two linear equations are equivalent. Dividing both sides of the given equation by 5 yields $-3x + 5y = 13$. Dividing both sides of choice C by 4 also yields $-3x + 5y = 13$, so choice C is equivalent to the given equation. Thus, choice C could be the second equation in the system.

Choice A is incorrect. The system consisting of this equation and the given equation has one solution, not infinitely many solutions. *Choice B* is incorrect. The system consisting of this equation and the given equation has one solution, not infinitely many solutions. *Choice D* is incorrect. The system consisting of this equation and the given equation has no solution, not infinitely many solutions.

QUESTION 23

Choice B is correct. If the bus traveled at an average speed of 55 miles per hour (mph) on the highway for x hours, then the bus traveled $55x$ miles on the highway. If the bus traveled at an average speed of 25 mph on local roads for y hours, then the bus traveled $25y$ miles on local roads. It's given that the trip was 160 miles. This can be represented by the equation $55x + 25y = 160$. It's also given that the trip took 4 hours. This can be

represented by the equation $x + y = 4$. Therefore, the system consisting of the equations $55x + 25y = 160$ and $x + y = 4$ represents this situation.

Choice A is incorrect. This system of equations represents a situation where the trip was 4 miles and took 160 hours. *Choice C* is incorrect. This system of equations represents a situation where the trip was 4 miles and took 160 hours, and the bus traveled at an average speed of 25 mph on the highway and 55 mph on local roads. *Choice D* is incorrect. This system of equations represents a situation where the bus traveled at an average speed of 25 mph on the highway and 55 mph on local roads.

QUESTION 24

Choice B is correct. It's given that quadrilateral $P'Q'R'S'$ is similar to quadrilateral $PQRS$, where P, Q, R, and S correspond to P', Q', R', and S', respectively. Since corresponding angles of similar quadrilaterals are congruent, it follows that the measure of angle P is equal to the measure of angle P'. It's given that the measure of angle P is $30°$. Therefore, the measure of angle P' is $30°$.

Choice A is incorrect. This is $\frac{1}{3}$ the measure of angle P'. *Choice C* is incorrect and may result from conceptual or calculation errors. *Choice D* is incorrect. This is 3 times the measure of angle P'.

QUESTION 25

Choice B is correct. It's given that $f(x) = 2x + 244$ represents the perimeter, in centimeters (cm), of a rectangle with a length of x cm and a fixed width. If w represents a fixed width, in cm, then the perimeter, in cm, of a rectangle with a length of x cm and a fixed width of w cm can be given by the function $f(x) = 2x + 2w$. Therefore, $2x + 2w = 2x + 244$. Subtracting $2x$ from both sides of this equation yields $2w = 244$. Dividing both sides of this equation by 2 yields $w = 122$. Therefore, the width, in cm, of the rectangle is 122.

Choice A is incorrect and may result from conceptual or calculation errors. *Choice C* is incorrect and may result from conceptual or calculation errors. *Choice D* is incorrect and may result from conceptual or calculation errors.

QUESTION 26

Choice B is correct. Functions f and g are both exponential functions with a base of 0.40. Since 0.40 is less than 1, functions f and g are both decreasing exponential functions. This means that $f(x)$ and $g(x)$ decrease as x increases. Since $f(x)$ and $g(x)$ decrease as x increases, the maximum value of each function occurs at the least value of x for which the function is defined. It's given that functions f and g are defined for $x \geq 0$. Therefore, the maximum value of each function occurs at $x = 0$. Substituting 0 for x in the equation defining f yields $f(0) = 33(0.4)^{0+3}$, which is equivalent to $f(0) = 33(0.4)^3$, or $f(0) = 2.112$. Therefore, the maximum value of f is 2.112. Since the equation $f(x) = 33(0.4)^{x+3}$ doesn't display the value 2.112, the equation defining f doesn't display the maximum value of f. Substituting 0 for x in the equation defining g yields

$g(0)=33(0.16)(0.4)^{0-2}$, which can be rewritten as $g(0)=33(0.16)\left(\frac{1}{0.4^2}\right)$, or $g(0)=33(0.16)\left(\frac{1}{0.16}\right)$, which is equivalent to $g(0)=33$. Therefore, the maximum value of g is 33. Since the equation $g(x)=33(0.16)(0.4)^{x-2}$ displays the value 33, the equation defining g displays the maximum value of g. Thus, only equation II displays, as a constant or coefficient, the maximum value of the function it defines.

Choice A is incorrect and may result from conceptual or calculation errors.
Choice C is incorrect and may result from conceptual or calculation errors.
Choice D is incorrect and may result from conceptual or calculation errors.

QUESTION 27

The correct answer is $\frac{1}{16}$. Let p and q represent the solutions to the given equation. Then, the given equation can be rewritten as $64(x-p)(x-q)=0$, or $64x^2-64(p+q)+pq=0$. Since this equation is equivalent to the given equation, it follows that $-(16a+4b)=-64(p+q)$. Dividing both sides of this equation by -64 yields $\frac{16a+4b}{64}=p+q$, or $\frac{1}{16}(4a+b)=p+q$. Therefore, the sum of the solutions to the given equation, $p+q$, is equal to $\frac{1}{16}(4a+b)$. Since it's given that the sum of the solutions to the given equation is $k(4a+b)$, where k is a constant, it follows that $k=\frac{1}{16}$. Note that 1/16, .0625, 0.062, and 0.063 are examples of ways to enter a correct answer.

Alternate approach: The given equation can be rewritten as $64x^2-4(4a+b)x+ab=0$, where a and b are positive constants. Dividing both sides of this equation by 4 yields $16x^2-(4a+b)x+\frac{ab}{4}=0$. The solutions for a quadratic equation in the form $Ax^2+Bx+C=0$, where A, B, and C are constants, can be calculated using the quadratic formula, $x=\frac{-B+\sqrt{B^2-4AC}}{2A}$ and $x=\frac{-B-\sqrt{B^2-4AC}}{2A}$. It follows that the sum of the solutions to a quadratic equation in the form $Ax^2+Bx+C=0$ is $\frac{-B+\sqrt{B^2-4AC}}{2A}+\frac{-B-\sqrt{B^2-4AC}}{2A}$, which can be rewritten as $\frac{-B+-B+\sqrt{B^2-4AC}-\sqrt{B^2-4AC}}{2A}$, which is equivalent to $\frac{-2B}{2A}$, or $-\frac{B}{A}$. In the equation $16x^2-(4a+b)x+\frac{ab}{4}=0$, $A=16$, $B=-(4a+b)$, and $C=\frac{ab}{4}$. Substituting 16 for A and $-(4a+b)$ for B in $-\frac{B}{A}$ yields $-\frac{-(4a+b)}{16}$, which can be rewritten as $\frac{1}{16}(4a+b)$. Thus, the sum of the solutions to the given equation is $\frac{1}{16}(4a+b)$. Since it's given that the sum of the solutions to the given equation is $k(4a+b)$, where k is a constant, it follows that $k=\frac{1}{16}$.