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SAT

Reading and Writing

27 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

Although critics believed that customers would never agree to pay to pick their own produce on farms, such concerns didn't _____ Booker T. Whatley's efforts to promote the practice. Thanks in part to Whatley's determined advocacy, farms that allow visitors to pick their own apples, pumpkins, and other produce can be found throughout the United States.

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

A) enhance
B) hinder
C) misrepresent
D) aggravate

2

The artisans of the Igun Eronmwon guild in Benin City, Nigeria, typically _____ the bronze- and brasscasting techniques that have been passed down through their families since the thirteenth century, but they don't strictly observe every tradition; for example, guild members now use air-conditioning motors instead of handheld bellows to help heat their forges.

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

A) experiment with
B) adhere to
C) improve on
D) grapple with

3

Set in a world where science fiction tropes exist as everyday realities, Charles Yu's 2010 novel *How to Live Safely in a Science Fictional Universe* traces a time traveler's quest to find his father. Because the journey at the novel's center is so _____, with the protagonist ricocheting chaotically across time, the reader often wonders whether the pair will ever be reunited.

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

A) haphazard
B) premeditated
C) inspirational
D) fruitless

4

In a 2019 study, Jeremy Gunawardena and colleagues found that the single-celled protozoan *Stentor roeseli* not only uses strategies to escape irritating stimuli but also switches strategies when one fails. This evidence of protozoans sophisticatedly "changing their minds" demonstrates that single-celled organisms may not be limited to _____ behaviors.

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

A) aggressive
B) rudimentary
C) evolving
D) advantageous

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CONTINUE

Some economic historians _____ that late nineteenth- and early twentieth-century households in the United States experienced an economy of scale when it came to food purchases—they assumed that large households spent less on food per person than did small households. Economist Trevon Logan showed, however, that a close look at the available data disproves this supposition.

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

A) surmised
B) contrived
C) questioned
D) regretted

The following text is adapted from Karel Čapek's 1920 play *R.U.R. (Rossum's Universal Robots)*, translated by Paul Selver and Nigel Playfair in 1923. Fabry and Busman are telling Miss Glory why their company manufactures robots.

FABRY: One Robot can replace two and a half *workmen*. The human machine, Miss Glory, was terribly *imperfect*. It had to be removed sooner or later.

BUSMAN: It was too expensive.

FABRY: It was not *effective*. It no longer answers the requirements of *modern engineering*. Nature has no idea of keeping pace with *modern labor*.

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

A) Explains
B) Rebuts
C) Defends
D) Fulfills

In 2014, Amelia Quon and her team at NASA set out to build a helicopter capable of flying on Mars. Because Mars's atmosphere is only one percent as dense as Earth's, the air of Mars would not provide enough resistance to the rotating blades of a standard helicopter for the aircraft to stay aloft. For five years, Quon's team tested designs in a lab that mimicked Mars's atmospheric conditions. The craft the team ultimately designed can fly on Mars because its blades are longer and rotate faster than those of a helicopter of the same size built for Earth.

According to the text, why would a helicopter built for Earth be unable to fly on Mars?

A) Because Mars and Earth have different atmospheric conditions
B) Because the blades of helicopters built for Earth are too large to work on Mars
C) Because the gravity of Mars is much weaker than the gravity of Earth
D) Because helicopters built for Earth are too small to handle the conditions on Mars

In West Africa, jalis have traditionally been keepers of information about family histories and records of important events. They have often served as teachers and advisers, too. New technologies may have changed some aspects of the role today, but jalis continue to be valued for knowing and protecting their peoples' stories.

Which choice best states the main idea of the text?

A) Even though there have been some changes in their role, jalis continue to preserve their communities' histories.
B) Although jalis have many roles, many of them like teaching best.
C) Jalis have been entertaining the people within their communities for centuries.
D) Technology can now do some of the things jalis used to be responsible for.

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9

The following text is adapted from Jack London's 1903 novel *The Call of the Wild*. Buck is a sled dog living with John Thornton in Yukon, Canada.

> Thornton alone held [Buck]. The rest of mankind was as nothing. Chance travellers might praise or pet him; but he was cold under it all, and from a too demonstrative man he would get up and walk away. When Thornton's partners, Hans and Pete, arrived on the long-expected raft, Buck refused to notice them till he learned they were close to Thornton; after that he tolerated them in a passive sort of way, accepting favors from them as though he favored them by accepting.

Which choice best states the main idea of the text?

A) Buck has become less social since he began living with Thornton.

B) Buck mistrusts humans and does his best to avoid them.

C) Buck has been especially well liked by most of Thornton's friends.

D) Buck holds Thornton in higher regard than any other person.

10

The Souls of Black Folk is a 1903 book by W.E.B. Du Bois. In the book, Du Bois suggests that upon hearing Black folk songs, he felt an intuitive and sometimes unexpected sense of cultural recognition: _____

Which quotation from *The Souls of Black Folk* most effectively illustrates the claim?

A) "[Black folk music] still remains as the singular spiritual heritage of the nation and the greatest gift of the Negro people."

B) "Ever since I was a child these songs have stirred me strangely. They came out of the South unknown to me, one by one, and yet at once I knew them as of me and of mine."

C) "Caricature has sought again to spoil the quaint beauty of the music, and has filled the air with many debased melodies which vulgar ears scarce know from the real. But the true Negro folk-song still lives in the hearts of those who have heard them truly sung and in the hearts of the Negro people."

D) "The songs are indeed the siftings of centuries; the music is far more ancient than the words, and in it we can trace here and there signs of development."

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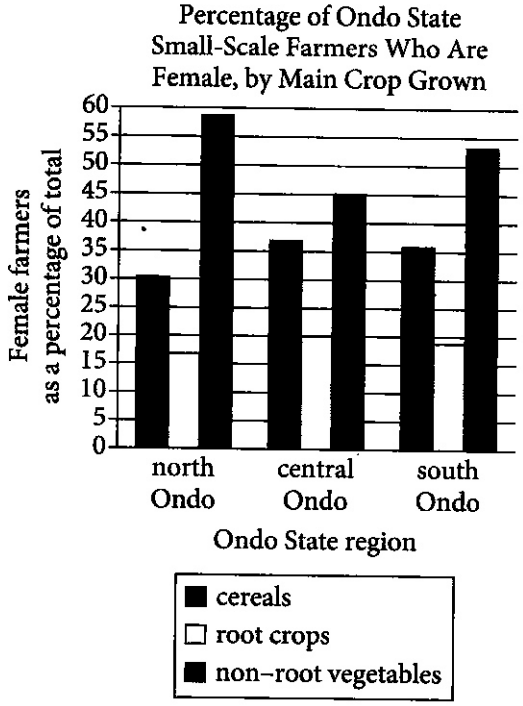
CONTINUE

11



Geographer Adebayo Oluwole Eludoyin and his colleagues surveyed small-scale farmers in three locations in Ondo State, Nigeria—which has mountainous terrain in the north, an urbanized center, and coastal terrain in the south—to learn more about their practices, like the types of crops they mainly cultivated. In some regions, female farmers were found to be especially prominent in the cultivation of specific types of crops and even constituted the majority of farmers who cultivated those crops; for instance, _____

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

A) most of the farmers who mainly cultivated cereals and most of the farmers who mainly cultivated non-root vegetables in south Ondo were women.

B) more women in central Ondo mainly cultivated root crops than mainly cultivated cereals.

C) most of the farmers who mainly cultivated non-root vegetables in north and south Ondo were women.

D) a relatively equal proportion of women across the three regions of Ondo mainly cultivated cereals.

12

Scholars have noted that F. Scott Fitzgerald's writings were likely influenced in part by his marriage to Zelda Fitzgerald, but many don't recognize Zelda as a writer in her own right. Indeed, Zelda authored several works herself, such as the novel *Save Me the Waltz* and numerous short stories. Thus, those who primarily view Zelda as an inspiration for F. Scott's writings _____

Which choice most logically completes the text?

A) overlook the many other factors that motivated F. Scott to write.

B) risk misrepresenting the full range of Zelda's contributions to literature.

C) may draw inaccurate conclusions about how F. Scott and Zelda viewed each other's works.

D) tend to read the works of F. Scott and Zelda in an overly autobiographical light.

13

Herbivorous sauropod dinosaurs could grow more than 100 feet long and weigh up to 80 tons, and some researchers have attributed the evolution of sauropods to such massive sizes to increased plant production resulting from high levels of atmospheric carbon dioxide during the Mesozoic era. However, there is no evidence of significant spikes in carbon dioxide levels coinciding with relevant periods in sauropod evolution, such as when the first large sauropods appeared, when several sauropod lineages underwent further evolution toward gigantism, or when sauropods reached their maximum known sizes, suggesting that _____

Which choice most logically completes the text?

A) fluctuations in atmospheric carbon dioxide affected different sauropod lineages differently.

B) the evolution of larger body sizes in sauropods did not depend on increased atmospheric carbon dioxide.

C) atmospheric carbon dioxide was higher when the largest known sauropods lived than it was when the first sauropods appeared.

D) sauropods probably would not have evolved to such immense sizes if atmospheric carbon dioxide had been even slightly higher.

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14

Known for her massive photorealistic paintings of African American figures floating or swimming in pools, Calida Garcia _____ was the logical choice to design the book cover for Ta-Nehisi Coates's *The Water Dancer*, a novel about an African American man who can travel great distances through water.

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

A) Rawles—
B) Rawles:
C) Rawles,
D) Rawles

15

In 2010, archaeologist Noel Hidalgo Tan was visiting the twelfth-century temple of Angkor Wat in Cambodia when he noticed markings of red paint on the temple _____ the help of digital imaging techniques, he discovered the markings to be part of an elaborate mural containing over 200 paintings.

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

A) walls, with
B) walls with
C) walls so with
D) walls. With

16

Cheng Dang and her colleagues at the University of Washington recently ran simulations to determine the extent to which individual snow _____ affect the amount of light reflecting off a snowy surface.

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

A) grain's physical properties'
B) grains' physical properties
C) grains' physical property's
D) grains physical properties

17

The Mission 66 initiative, which was approved by Congress in 1956, represented a major investment in the infrastructure of overburdened national _____ it prioritized physical improvements to the parks' roads, utilities, employee housing, and visitor facilities while also establishing educational programming for the public.

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

A) parks and
B) parks
C) parks;
D) parks,

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CONTINUE

18

The Progressive Era in the United States witnessed the rise of numerous Black women's clubs, local organizations that advocated for racial and gender equality. Among the clubs' leaders _____ Josephine St. Pierre Ruffin, founder of the Women's Era Club of Boston.

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

A) was
B) were
C) are
D) have been

19

Eli Eisenberg, a genetics expert at Tel Aviv University in Israel, recently discovered that _____ have a special genetic ability called RNA editing that confers evolutionary advantages.

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

A) cephalopods, ocean dwellers that include the squid, the octopus, and the cuttlefish
B) cephalopods—ocean dwellers—that include the squid, the octopus, and the cuttlefish,
C) cephalopods, ocean dwellers that include: the squid, the octopus, and the cuttlefish,
D) cephalopods—ocean dwellers that include the squid, the octopus, and the cuttlefish—

20

A model created by biologist Luis Valente predicts that the rate of speciation—the rate at which new species form—on an isolated island located approximately 5,000 kilometers from the nearest mainland _____ triple the rate of speciation on an island only 500 kilometers from the mainland.

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

A) being
B) to be
C) to have been
D) will be

21

Award-winning travel writer Linda Watanabe McFerrin considers the background research she conducts on destinations featured in her travel books to be its own reward. _____ McFerrin admits to finding the research phase of her work just as fascinating and engaging as exploring a location in person.

Which choice completes the text with the most logical transition?

A) By contrast,
B) Likewise,
C) Besides,
D) In fact,

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22

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

- Bharati Mukherjee was an Indian-born author of novels and short stories.
- She published the novel *The Holder of the World* in 1993.
- A central character in the novel is a woman living in twentieth-century United States.
- Another central character is a woman living in seventeenth-century India.

The student wants to introduce the novel *The Holder of the World* to an audience already familiar with Bharati Mukherjee. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) Bharati Mukherjee's settings include both twentieth-century United States and seventeenth-century India.

B) In addition to her novel *The Holder of the World*, which was published in 1993, Indian-born author Bharati Mukherjee wrote other novels and short stories.

C) Bharati Mukherjee's novel *The Holder of the World* centers around two women, one living in twentieth-century United States and the other in seventeenth-century India.

D) *The Holder of the World* was not the only novel written by Indian-born author Bharati Mukherjee.

23

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

- Pterosaurs were flying reptiles that existed millions of years ago.
- In a 2021 study, Anusuya Chinsamy-Turan analyzed fragments of pterosaur jawbones located in the Sahara Desert.
- She was initially unsure if the bones belonged to juvenile or adult pterosaurs.
- She used advanced microscope techniques to determine that the bones had few growth lines relative to the bones of fully grown pterosaurs.
- She concluded that the bones belonged to juveniles.

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

A) In 2021, Chinsamy-Turan studied pterosaur jawbones and was initially unsure if the bones belonged to juveniles or adults.

B) Pterosaur jawbones located in the Sahara Desert were the focus of a 2021 study.

C) In a 2021 study, Chinsamy-Turan used advanced microscope techniques to analyze the jawbones of pterosaurs, flying reptiles that existed millions of years ago.

D) In a 2021 study, Chinsamy-Turan determined that pterosaur jawbones located in the Sahara Desert had few growth lines relative to the bones of fully grown pterosaurs and thus belonged to juveniles.

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24

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

- Samuel Selvon was a Trinidadian author.
- *The Lonely Londoners* is one of his most celebrated novels.
- Selvon published the novel in 1956.
- It is about a group of men who emigrate from the Caribbean to Great Britain after World War II.
- Some of *The Lonely Londoners*' characters also appear in Selvon's later novel *Moses Ascending*.

The student wants to introduce Samuel Selvon and his novel *The Lonely Londoners* to a new audience. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) In 1956, Trinidadian author Samuel Selvon published one of his most celebrated novels, *The Lonely Londoners*, which is about a group of men who emigrate from the Caribbean to Great Britain after World War II.

B) Samuel Selvon wrote the novel *Moses Ascending* after he wrote *The Lonely Londoners*.

C) *The Lonely Londoners*, a celebrated novel that was published in 1956, depicts post–World War II Caribbean migration from the perspective of a Trinidadian author.

D) Some of the characters who appear in Samuel Selvon's *Moses Ascending* also appear in *The Lonely Londoners*.

25

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

- Seven species of sea turtle exist today.
- Five sea turtle species can be found in the Atlantic Ocean.
- One of those species is the Kemp's ridley sea turtle.
- Its scientific name is *Lepidochelys kempii*.
- Another of those species is the olive ridley sea turtle.
- Its scientific name is *Lepidochelys olivacea*.

The student wants to emphasize a similarity between the two sea turtle species. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) Among the seven species of sea turtle is the olive ridley sea turtle, which can be found in the Atlantic Ocean.

B) The Kemp's ridley sea turtle is referred to as *Lepidochelys kempii*, while the olive ridley sea turtle is referred to as *Lepidochelys olivacea*.

C) Both the Kemp's ridley sea turtle and the olive ridley sea turtle can be found in the Atlantic Ocean.

D) The Kemp's ridley sea turtle *(Lepidochelys kempii)* and the olive ridley sea turtle *(Lepidochelys olivacea)* are different species.

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26

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

- In 2019, Emily Shepard and colleagues in the UK and Germany studied the effect of wind on auks' success in landing at cliffside nesting sites.
- They found as wind conditions intensified, the birds needed more attempts in order to make a successful landing.
- When the wind was still, almost 100% of landing attempts were successful.
- In a strong breeze, approximately 40% of attempts were successful.
- In near-gale conditions, only around 20% of attempts were successful.

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

A) For a 2019 study, researchers from the UK and Germany collected data on auks' attempts to land at cliffside nesting sites in different wind conditions.

B) Emily Shepard and her colleagues wanted to know the extent to which wind affected auks' success in landing at cliffside nesting sites, so they conducted a study.

C) Knowing that auks often need multiple attempts to land at their cliffside nesting sites, Emily Shepard studied the birds' success rate, which was only around 20% in some conditions.

D) Emily Shepard's 2019 study of auks' success in landing at cliffside nesting sites showed that as wind conditions intensified, the birds' success rate decreased.

27

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

- Abdulrazak Gurnah was awarded the 2021 Nobel Prize in Literature.
- Gurnah was born in Zanzibar in East Africa and currently lives in the United Kingdom.
- Many readers have singled out Gurnah's 1994 book *Paradise* for praise.
- *Paradise* is a historical novel about events that occurred in colonial East Africa.

The student wants to introduce *Paradise* to an audience unfamiliar with the novel and its author. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) Abdulrazak Gurnah, who wrote *Paradise* and later was awarded the Nobel Prize in Literature, was born in Zanzibar in East Africa and currently lives in the United Kingdom.

B) Many readers have singled out Abdulrazak Gurnah's 1994 book *Paradise*, a historical novel about colonial East Africa, for praise.

C) A much-praised historical novel about colonial East Africa, *Paradise* (1994) was written by Abdulrazak Gurnah, winner of the 2021 Nobel Prize in Literature.

D) *Paradise* is a historical novel about events that occurred in colonial East Africa, Abdulrazak Gurnah's homeland.

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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Test begins on the next page.

Reading and Writing

27 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

In studying the use of external stimuli to reduce the itching sensation caused by an allergic histamine response, Louise Ward and colleagues found that while harmless applications of vibration or warming can provide a temporary distraction, such _____ stimuli actually offer less relief than a stimulus that seems less benign, like a mild electric shock.

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

A) deceptive
B) innocuous
C) novel
D) impractical

2

New and interesting research conducted by Suleiman A. Al-Sweedan and Moath Alhaj is inspired by their observation that though there have been many studies of the effect of high altitude on blood chemistry, there is a _____ studies of the effect on blood chemistry of living in locations below sea level, such as the California towns of Salton City and Seeley.

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

A) quarrel about
B) paucity of
C) profusion of
D) verisimilitude in

3

Whether the reign of a French monarch such as Hugh Capet or Henry I was historically consequential or relatively uneventful, its trajectory was shaped by questions of legitimacy and therefore cannot be understood without a corollary understanding of the factors that allowed the monarch to _____ his right to hold the throne.

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

A) reciprocate
B) annotate
C) buttress
D) disengage

4

Researcher Haesung Jung led a 2020 study showing that individual acts of kindness can _____ prosocial behavior across a larger group. Jung and her team found that bystanders who witness a helpful act become more likely to offer help to someone else, and in doing so, can inspire still others to act.

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

A) require
B) remember
C) foster
D) discourage

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CONTINUE

5

The following text is adapted from *Indian Boyhood*, a 1902 memoir by Ohiyesa (Charles A. Eastman), a Santee Dakota writer. In the text, Ohiyesa recalls how the women in his tribe harvested maple syrup during his childhood.

> Now the women began to test the trees—moving leisurely among them, axe in hand, and striking a single quick blow, to see if the sap would appear. The trees, like people, have their individual characters; some were ready to yield up their life-blood, while others were more reluctant. Now one of the birchen basins was set under each tree, and a hardwood chip driven deep into the cut which the axe had made. From the corners of this chip—at first drop by drop, then more freely—the sap trickled into the little dishes.

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

A) It portrays the range of personality traits displayed by the women as they work.

B) It foregrounds the beneficial relationship between humans and maple trees.

C) It demonstrates how human behavior can be influenced by the natural environment.

D) It elaborates on an aspect of the maple trees that the women evaluate.

6

The following text is from Charlotte Brontë's 1847 novel *Jane Eyre*. Jane, the narrator, works as a governess at Thornfield Hall.

> I went on with my day's business tranquilly; but ever and anon vague suggestions kept wandering across my brain of reasons why I should quit Thornfield; and I kept involuntarily framing advertisements and pondering conjectures about new situations: these thoughts I did not think to check; they might germinate and bear fruit if they could.

Which choice best states the main purpose of the text?

A) To convey a contrast between Jane's outward calmness and internal restlessness

B) To emphasize Jane's loyalty to the people she works for at Thornfield Hall

C) To demonstrate that Jane finds her situation both challenging and deeply fulfilling

D) To describe Jane's determination to secure employment outside of Thornfield Hall

7

Musician Joni Mitchell, who is also a painter, uses images she creates for her album covers to emphasize ideas expressed in her music. For the cover of her album *Turbulent Indigo* (1994), Mitchell painted a striking self-portrait that closely resembles Vincent van Gogh's *Self-Portrait with Bandaged Ear* (1889). The image calls attention to the album's title song, in which Mitchell sings about the legacy of the postimpressionist painter. In that song, Mitchell also hints that she feels a strong artistic connection to Van Gogh—an idea that is reinforced by her imagery on the cover.

Which choice best describes the overall structure of the text?

A) It presents a claim about Mitchell, then gives an example supporting that claim.

B) It discusses Van Gogh's influence on Mitchell, then considers Mitchell's influence on other artists.

C) It describes a similarity between two artists, then notes a difference between them.

D) It describes the songs on *Turbulent Indigo*, then explains how they relate to the album's cover.

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8

A study by a team including finance professor Madhu Veeraraghavan suggests that exposure to sunshine during the workday can lead to overly optimistic behavior. Using data spanning from 1994 to 2010 for a set of US companies, the team compared over 29,000 annual earnings forecasts to the actual earnings later reported by those companies. The team found that the greater the exposure to sunshine at work in the two weeks before a manager submitted an earnings forecast, the more the manager's forecast exceeded what the company actually earned that year.

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

A) To summarize the results of the team's analysis

B) To present a specific example that illustrates the study's findings

C) To explain part of the methodology used in the team's study

D) To call out a challenge the team faced in conducting its analysis

9

Text 1

Most animals can regenerate some parts of their bodies, such as skin. But when a three-banded panther worm is cut into three pieces, each piece grows into a new worm. Researchers are investigating this feat partly to learn more about humans' comparatively limited abilities to regenerate, and they're making exciting progress. An especially promising discovery is that both humans and panther worms have a gene for early growth response (EGR) linked to regeneration.

Text 2

When Mansi Srivastava and her team reported that panther worms, like humans, possess a gene for EGR, it caused excitement. However, as the team pointed out, the gene likely functions very differently in humans than it does in panther worms. Srivastava has likened EGR to a switch that activates other genes involved in regeneration in panther worms, but how this switch operates in humans remains unclear.

Based on the texts, what would the author of Text 2 most likely say about Text 1's characterization of the discovery involving EGR?

A) It is reasonable given that Srivastava and her team have identified how EGR functions in both humans and panther worms.

B) It is overly optimistic given additional observations from Srivastava and her team.

C) It is unexpected given that Srivastava and her team's findings were generally met with enthusiasm.

D) It is unfairly dismissive given the progress that Srivastava and her team have reported.

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CONTINUE

10

Credited Film Output of James Young Deer, Dark Cloud, Edwin Carewe, and Lillian St. Cyr

Individual	Years active	Number of films known and commonly credited
James Young Deer	1909–1924	33 (actor), 35 (director), 10 (writer)
Dark Cloud	1910–1920	35 (actor), 1 (writer)
Edwin Carewe	1912–1934	47 (actor), 58 (director), 20 (producer), 4 (writer)
Lillian St. Cyr (Red Wing)	1908–1921	66 (actor)

Some researchers studying Indigenous actors and filmmakers in the United States have turned their attention to the early days of cinema, particularly the 1910s and 1920s, when people like James Young Deer, Dark Cloud, Edwin Carewe, and Lillian St. Cyr (known professionally as Red Wing) were involved in one way or another with numerous films. In fact, so many films and associated records for this era have been lost that counts of those four figures' output should be taken as bare minimums rather than totals; it's entirely possible, for example, that _____

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

A) Dark Cloud acted in significantly fewer films than did Lillian St. Cyr, who is credited with 66 performances.

B) Edwin Carewe's 47 credited acting roles includes only films made after 1934.

C) Lillian St. Cyr acted in far more than 66 films and Edwin Carewe directed more than 58.

D) James Young Deer actually directed 33 films and acted in only 10.

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11

Mosasaurs were large marine reptiles that lived in the Late Cretaceous period, approximately 100 million to 66 million years ago. Celina Suarez, Alberto Pérez-Huerta, and T. Lynn Harrell Jr. examined oxygen-18 isotopes in mosasaur tooth enamel in order to calculate likely mosasaur body temperatures and determined that mosasaurs were endothermic—that is, they used internal metabolic processes to maintain a stable body temperature in a variety of ambient temperatures. Suarez, Pérez-Huerta, and Harrell claim that endothermy would have enabled mosasaurs to include relatively cold polar waters in their range.

Which finding, if true, would most directly support Suarez, Pérez-Huerta, and Harrell's claim?

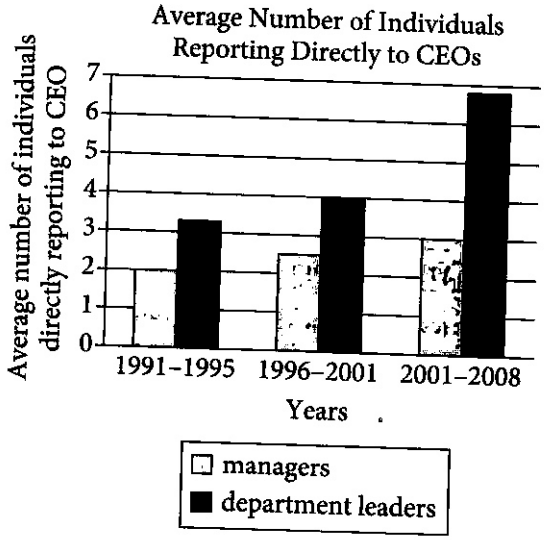
A) Mosasaurs' likely body temperatures are easier to determine from tooth enamel oxygen-18 isotope data than the body temperatures of nonendothermic Late Cretaceous marine reptiles are.

B) Fossils of both mosasaurs and nonendothermic marine reptiles have been found in roughly equal numbers in regions known to be near the poles during the Late Cretaceous, though in lower concentrations than elsewhere.

C) Several mosasaur fossils have been found in regions known to be near the poles during the Late Cretaceous, while relatively few fossils of nonendothermic marine reptiles have been found in those locations.

D) During the Late Cretaceous, seawater temperatures were likely higher throughout mosasaurs' range, including near the poles, than seawater temperatures at those same latitudes are today.

12



Considering a large sample of companies, economics experts Maria Guadalupe, Julie Wulf, and Raghuram Rajan assessed the number of managers and leaders from different departments who reported directly to a chief executive officer (CEO). According to the researchers, the findings suggest that across the years analyzed, there was a growing interest among CEOs in connecting with more departments in their companies.

Which choice best describes data from the graph that support the researchers' conclusion?

A) The average numbers of managers and department leaders reporting directly to their CEO didn't fluctuate from the 1991–1995 period to the 2001–2008 period.

B) The average number of managers reporting directly to their CEO was highest in the 1996–2001 period.

C) The average number of department leaders reporting directly to their CEO was greater than the average number of managers reporting directly to their CEO in each of the three periods studied.

D) The average number of department leaders reporting directly to their CEO rose over the three periods studied.

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CONTINUE

13

Given that stars and planets initially form from the same gas and dust in space, some astronomers have posited that host stars (such as the Sun) and their planets (such as those in our solar system) are composed of the same materials, with the planets containing equal or smaller quantities of the materials that make up the host star. This idea is also supported by evidence that rocky planets in our solar system are composed of some of the same materials as the Sun.

Which finding, if true, would most directly weaken the astronomers' claim?

A) Most stars are made of hydrogen and helium, but when cooled they are revealed to contain small amounts of iron and silicate.

B) A nearby host star is observed to contain the same proportion of hydrogen and helium as that of the Sun.

C) Evidence emerges that the amount of iron in some rocky planets is considerably higher than the amount in their host star.

D) The method for determining the composition of rocky planets is discovered to be less effective when used to analyze other kinds of planets.

14

While attending school in New York City in the 1980s, Okwui Enwezor encountered few works by African artists in exhibitions, despite New York's reputation as one of the best places to view contemporary art from around the world. According to an arts journalist, later in his career as a renowned curator and art historian, Enwezor sought to remedy this deficiency, not by focusing solely on modern African artists, but by showing how their work fits into the larger context of global modern art and art history.

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

A) As curator of the Haus der Kunst in Munich, Germany, Enwezor organized a retrospective of Ghanaian sculptor El Anatsui's work entitled *El Anatsui: Triumphant Scale*, one of the largest art exhibitions devoted to a Black artist in Europe's history.

B) In the exhibition *Postwar: Art Between the Pacific and the Atlantic, 1945–1965*, Enwezor and cocurator Katy Siegel brought works by African artists such as Malangatana Ngwenya together with pieces by major figures from other countries, like US artist Andy Warhol and Mexico's David Siqueiros.

C) Enwezor's work as curator of the 2001 exhibition *The Short Century: Independence and Liberation Movements in Africa, 1945–1994* showed how African movements for independence from European colonial powers following the Second World War profoundly influenced work by African artists of the period, such as Kamala Ibrahim Ishaq and Thomas Mukarobgwa.

D) Enwezor organized the exhibition *In/sight: African Photographers, 1940 to the Present* not to emphasize a particular aesthetic trend but to demonstrate the broad range of ways in which African artists have approached the medium of photography.

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15

One challenge when researching whether holding elected office changes a person's behavior is the problem of ensuring that the experiment has an appropriate control group. To reveal the effect of holding office, researchers must compare people who hold elected office with people who do not hold office but who are otherwise similar to the office-holders. Since researchers are unable to control which politicians win elections, they therefore _____

Which choice most logically completes the text?

A) struggle to find valid data about the behavior of politicians who do not currently hold office.

B) can only conduct valid studies with people who have previously held office rather than people who presently hold office.

C) should select a control group of people who differ from office holders in several significant ways.

D) will find it difficult to identify a group of people who can function as an appropriate control group for their studies.

Compiled in the late 1500s largely through the efforts of Indigenous scribes, *Cantares Mexicanos* is the most important collection of poetry in Classical Nahuatl, the principal language of the Aztec Empire. The poems portray Aztec society before the occupation of the empire by the army of Spain, and marginal notes in *Cantares Mexicanos* indicate that much of the collection's content predates the initial invasion. Nonetheless, some of the poems contain inarguable references to beliefs and customs common in Spain during this era. Thus, some scholars have concluded that _____

Which choice most logically completes the text?

A) while its content largely predates the invasion, *Cantares Mexicanos* also contains additions made after the invasion.

B) although those who compiled *Cantares Mexicanos* were fluent in Nahuatl, they had limited knowledge of the Spanish language.

C) before the invasion by Spain, the poets of the Aztec Empire borrowed from the literary traditions of other societies.

D) the references to beliefs and customs in Spain should be attributed to a coincidental resemblance between the societies of Spain and the Aztec Empire.

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CONTINUE

17

To humans, it does not appear that the golden orb-weaver spider uses camouflage to capture its _____ the brightly colored arachnid seems to wait conspicuously in the center of its large circular web for insects to approach. Researcher Po Peng of the University of Melbourne has explained that the spider's distinctive coloration may in fact be part of its appeal.

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

A) prey, rather,
B) prey rather,
C) prey, rather;
D) prey; rather,

18

Bonnie Buratti of NASA's Jet Propulsion Laboratory _____ data about Saturn's rings collected by the *Cassini* spacecraft when she made an interesting discovery: the tiny moons embedded between and within Saturn's rings are shaped by the buildup of ring material on the moons' surfaces.

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

A) studies
B) has been studying
C) will study
D) was studying

19

On July 23, 1854, a clipper ship called the *Flying Cloud* entered San Francisco _____ left New York Harbor under the guidance of Captain Josiah Perkins Creesy and his wife, navigator Eleanor Creesy, a mere 89 days and 8 hours earlier, the celebrated ship set a record that would stand for 135 years.

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

A) Bay and having
B) Bay. Having
C) Bay, having
D) Bay having

20

Bengali author Toru Dutt's *A Sheaf Gleaned in French Fields* (1876), a volume of English translations of French poems, _____ scholars' understanding of the transnational and multilingual contexts in which Dutt lived and worked.

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

A) has enhanced
B) are enhancing
C) have enhanced
D) enhance

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21

Hegra is an archaeological site in present-day Saudi Arabia and was the second largest city of the Nabataean Kingdom (fourth century BCE to first century CE). Archaeologist Laila Nehmé recently traveled to Hegra to study its ancient _____ into the rocky outcrops of a vast desert, these burial chambers seem to blend seamlessly with nature.

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

A) tombs. Built
B) tombs, built
C) tombs and built
D) tombs built

22

In 1937, Chinese American screen actor Anna May Wong, who had portrayed numerous villains and secondary characters but never a heroine, finally got a starring role in Paramount Pictures' *Daughter of Shanghai*, a film that _____ "expanded the range of possibilities for Asian images on screen."

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

A) critic, Stina Chyn, claims
B) critic, Stina Chyn, claims,
C) critic Stina Chyn claims
D) critic Stina Chyn, claims,

23

The Arctic-Alpine Botanic Garden in Norway and the Jardim Botânico of Rio de Janeiro in Brazil are two of many botanical gardens around the world dedicated to growing diverse plant _____ fostering scientific research; and educating the public about plant conservation.

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

A) species, both native and nonnative,
B) species, both native and nonnative;
C) species; both native and nonnative,
D) species both native and nonnative,

24

The Babylonian king Hammurabi achieved much during his forty-year reign. He conquered all of Mesopotamia and built Babylon into one of the most powerful cities of the ancient world. Today, _____ he is mainly remembered for a code of laws inscribed on a seven-foot-tall block of stone: the Code of Hammurabi.

Which choice completes the text with the most logical transition?

A) therefore,
B) likewise,
C) however,
D) for instance,

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25

In her poetry collection *Thomas and Beulah*, Rita Dove interweaves the titular characters' personal stories with broader historical narratives. She places Thomas's journey from the American South to the Midwest in the early 1900s within the larger context of the Great Migration. _____ Dove sets events from Beulah's personal life against the backdrop of the US Civil Rights Movement.

Which choice completes the text with the most logical transition?

A) Specifically,

B) Thus,

C) Regardless,

D) Similarly,

26

When designing costumes for film, American artist Suttirat Larlarb typically custom fits the garments to each actor. _____ for the film *Sunshine*, in which astronauts must reignite a dying Sun, she designed a golden spacesuit and had a factory reproduce it in a few standard sizes; lacking a tailor-made quality, the final creations reflected the ungainliness of actual spacesuits.

Which choice completes the text with the most logical transition?

A) Nevertheless,

B) Thus,

C) Likewise,

D) Moreover,

27

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

- Astronomers estimate that the number of comets orbiting the Sun is in the billions.
- 81P/Wild is one of many comets whose orbit has changed over time.
- 81P/Wild's orbit once lay between the orbits of Uranus and Jupiter.
- The comet's orbit is now positioned between the orbits of Jupiter and Mars.

The student wants to make and support a generalization about the orbits of comets. Which choice most effectively uses relevant information from the notes to accomplish these goals?

A) Astronomers estimate that the number of comets orbiting the Sun is in the billions; the comets' orbits may change over time.

B) Like Uranus, Jupiter, and Mars, billions of comets orbit the Sun.

C) One example of a comet is 81P/Wild, whose orbit around the Sun once lay between Uranus's and Jupiter's orbits but is now positioned between those of Jupiter and Mars.

D) A comet's orbit around the Sun may change over time: the orbit of comet 81P/Wild once lay between the orbits of Uranus and Jupiter but is now positioned between those of Jupiter and Mars.

STOP

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Math

22 QUESTIONS

DIRECTIONS

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

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- All figures lie in a plane.
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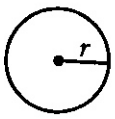
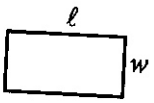
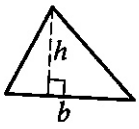
REFERENCE



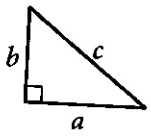
$A = \pi r^2$
$C = 2\pi r$



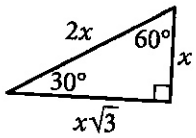
$A = \ell w$

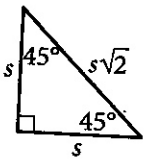


$A = \frac{1}{2}bh$

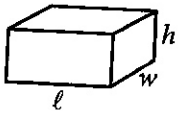


$c^2 = a^2 + b^2$

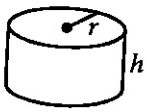




Special Right Triangles

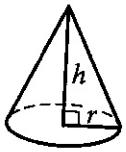


$V = \ell wh$

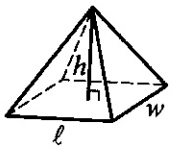


$V = \pi r^2 h$

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



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



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

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

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

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

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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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1

If $x = 7$, what is the value of $x + 20$?

A) 13

B) 20

C) 27

D) 34

2

Data set X: 5, 9, 9, 13

Data set Y: 5, 9, 9, 13, 27

The lists give the values in data sets X and Y. Which statement correctly compares the mean of data set X and the mean of data set Y?

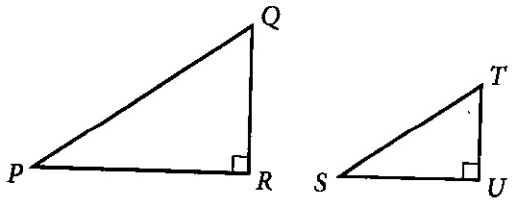
A) The mean of data set X is greater than the mean of data set Y.

B) The mean of data set X is less than the mean of data set Y.

C) The means of data set X and data set Y are equal.

D) There is not enough information to compare the means.

3



Note: Figures not drawn to scale.

Right triangles PQR and STU are similar, where P corresponds to S. If the measure of angle Q is 18°, what is the measure of angle S?

A) 18°

B) 72°

C) 82°

D) 162°

4

A rocket contained 467,000 kilograms (kg) of propellant before launch. Exactly 21 seconds after launch, 362,105 kg of this propellant remained. On average, approximately how much propellant, in kg, did the rocket burn each second after launch?

A) 4,995

B) 17,243

C) 39,481

D) 104,895

5

$$4x = 20$$
$$-3x + y = -7$$

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

A) −27

B) −13

C) 13

D) 27

6

A certain apprentice has enrolled in 85 hours of training courses. The equation $10x + 15y = 85$ represents this situation, where x is the number of on-site training courses and y is the number of online training courses this apprentice has enrolled in. How many more hours does each online training course take than each on-site training course?

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CONTINUE

7

Square X has a side length of 12 centimeters. The perimeter of square Y is 2 times the perimeter of square X. What is the length, in centimeters, of one side of square Y?

A) 6
B) 10
C) 14
D) 24

8

$$g(m) = -0.05m + 12.1$$

The given function g models the number of gallons of gasoline that remains from a full gas tank in a car after driving m miles. According to the model, about how many gallons of gasoline are used to drive each mile?

A) 0.05
B) 12.1
C) 20
D) 242.0

9

If $|4x - 4| = 112$, what is the positive value of $x - 1$?

10

$$\frac{1}{7b} = \frac{11x}{y}$$

The given equation relates the positive numbers b, x, and y. Which equation correctly expresses x in terms of b and y?

A) $x = \frac{7by}{11}$
B) $x = y - 77b$
C) $x = \frac{y}{77b}$
D) $x = 77by$

11

x	10	15	20	25
$f(x)$	82	137	192	247

The table shows four values of x and their corresponding values of $f(x)$. There is a linear relationship between x and $f(x)$ that is defined by the equation $f(x) = mx - 28$, where m is a constant. What is the value of m?

12

$$(5x^3 - 3) - (-4x^3 + 8)$$

The given expression is equivalent to $bx^3 - 11$, where b is a constant. What is the value of b?

13

$$y > 14$$
$$4x + y < 18$$

The point $(x, 53)$ is a solution to the system of inequalities in the xy-plane. Which of the following could be the value of x?

A) −9
B) −5
C) 5
D) 9

14

Bacteria are growing in a liquid growth medium. There were 300,000 cells per milliliter during an initial observation. The number of cells per milliliter doubles every 3 hours. How many cells per milliliter will there be 15 hours after the initial observation?

A) 1,500,000
B) 2,400,000
C) 4,500,000
D) 9,600,000

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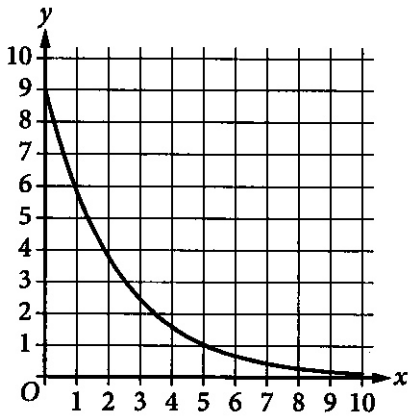
CONTINUE

15



The graph gives the estimated number of catalogs y, in thousands, a company sent to its customers at the end of each year, where x represents the number of years since the end of 1992, where $0 \le x \le 10$. Which statement is the best interpretation of the y-intercept in this context?

A) The estimated total number of catalogs the company sent to its customers during the first 10 years was 9,000.

B) The estimated total number of catalogs the company sent to its customers from the end of 1992 to the end of 2002 was 90.

C) The estimated number of catalogs the company sent to its customers at the end of 1992 was 9.

D) The estimated number of catalogs the company sent to its customers at the end of 1992 was 9,000.

16

Which expression is equivalent to $\sqrt[7]{x^9y^9}$, where x and y are positive?

A) $(xy)^{\frac{7}{9}}$

B) $(xy)^{\frac{9}{7}}$

C) $(xy)^{16}$

D) $(xy)^{63}$

17

The population of City A increased by 7% from 2015 to 2016. If the 2016 population is k times the 2015 population, what is the value of k?

A) 0.07

B) 0.7

C) 1.07

D) 1.7

18

Which of the following systems of linear equations has no solution?

A) $x = 3$
$y = 5$

B) $y = 6x + 6$
$y = 5x + 6$

C) $y = 16x + 3$
$y = 16x + 19$

D) $y = 5$
$y = 5x + 5$

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CONTINUE

20

The first term of a sequence is 9. Each term after the first is 4 times the preceding term. If w represents the nth term of the sequence, which equation gives w in terms of n?

A) $w = 4(9^n)$

B) $w = 4(9^{n-1})$

C) $w = 9(4^n)$

D) $w = 9(4^{n-1})$

21

The minimum value of x is 12 less than 6 times another number n. Which inequality shows the possible values of x?

A) $x \leq 6n - 12$

B) $x \geq 6n - 12$

C) $x \leq 12 - 6n$

D) $x \geq 12 - 6n$

22

$RS = 20$
$ST = 48$
$TR = 52$

The side lengths of right triangle RST are given. Triangle RST is similar to triangle UVW, where S corresponds to V and T corresponds to W. What is the value of tan W?

A) $\frac{5}{13}$

B) $\frac{5}{12}$

C) $\frac{12}{13}$

D) $\frac{12}{5}$

23

The graph of $9x - 10y = 19$ is translated down 4 units in the xy-plane. What is the x-coordinate of the x-intercept of the resulting graph?

STOP

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Math

22 QUESTIONS

DIRECTIONS

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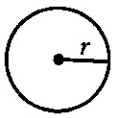
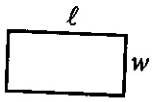
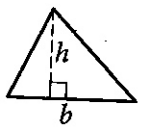


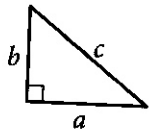
$A = \pi r^2$
$C = 2\pi r$



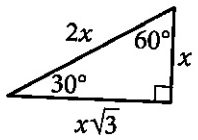
$A = \ell w$

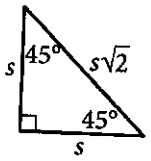


$A = \frac{1}{2}bh$

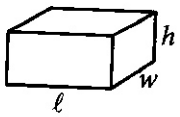


$c^2 = a^2 + b^2$

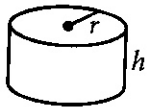




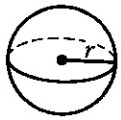
Special Right Triangles



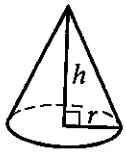
$V = \ell wh$



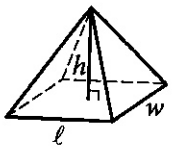
$V = \pi r^2 h$



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



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



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

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

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

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

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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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CONTINUE

1

There are 55 students in Spanish club. A sample of the Spanish club students was selected at random and asked whether they intend to enroll in a new study program. Of those surveyed, 20% responded that they intend to enroll in the study program. Based on this survey, which of the following is the best estimate of the total number of Spanish club students who intend to enroll in the study program?

A) 11

B) 20

C) 44

D) 55

2

A machine makes large boxes or small boxes, one at a time, for a total of 700 minutes each day. It takes the machine 10 minutes to make a large box or 5 minutes to make a small box. Which equation represents the possible number of large boxes, x, and small boxes, y, the machine can make each day?

A) $5x + 10y = 700$

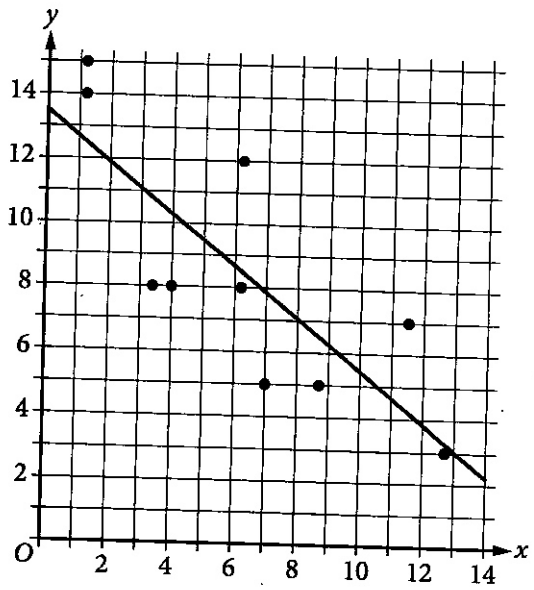
B) $10x + 5y = 700$

C) $(x + y)(10 + 5) = 700$

D) $(10 + x)(5 + y) = 700$

3

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



Which of the following equations best represents the line of best fit shown?

A) $y = 13.5 + 0.8x$

B) $y = 13.5 - 0.8x$

C) $y = -13.5 + 0.8x$

D) $y = -13.5 - 0.8x$

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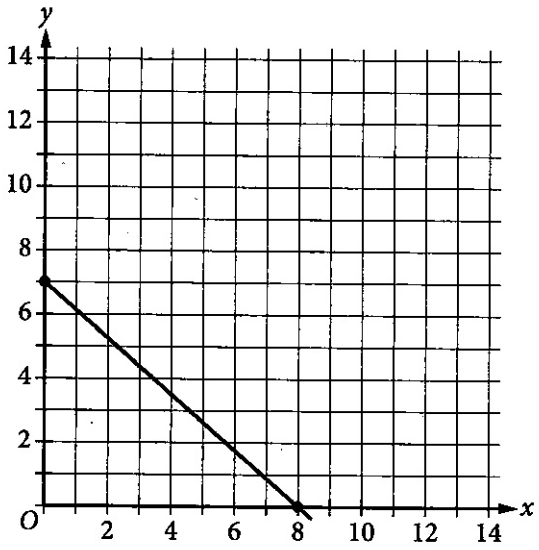
CONTINUE

4



The point with coordinates $(d, 4)$ lies on the line shown. What is the value of d?

A) $\frac{7}{2}$

B) $\frac{26}{7}$

C) $\frac{24}{7}$

D) $\frac{27}{8}$

5

x	$f(x)$
-1	10
0	14
1	20

For the quadratic function f, the table shows three values of x and their corresponding values of $f(x)$. Which equation defines f?

A) $f(x) = 3x^2 + 3x + 14$

B) $f(x) = 5x^2 + x + 14$

C) $f(x) = 9x^2 - x + 14$

D) $f(x) = x^2 + 5x + 14$

6

The function f is defined by $f(x) = \frac{x + 15}{5}$, and $f(a) = 10$, where a is a constant. What is the value of a?

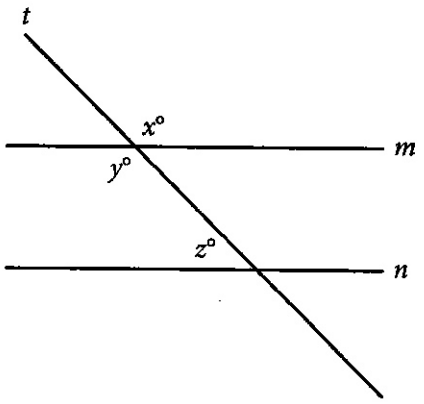
A) 5

B) 10

C) 35

D) 65

7



Note: Figure not drawn to scale.

In the figure, lines m and n are parallel. If $x = 6k + 13$ and $y = 8k - 29$, what is the value of z?

A) 3

B) 21

C) 41

D) 139

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CONTINUE

8

Line p is defined by $2y + 18x = 9$. Line r is perpendicular to line p in the xy-plane. What is the slope of line r?

A) -9

B) $-\frac{1}{9}$

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

D) 9

9

A sample of oak has a density of 807 kilograms per cubic meter. The sample is in the shape of a cube, where each edge has a length of 0.90 meters. To the nearest whole number, what is the mass, in kilograms, of this sample?

A) 588

B) 726

C) 897

D) 1,107

10

$$P(t) = 290(1.04)^{\left(\frac{4}{6}\right)t}$$

The function P models the population, in thousands, of a certain city t years after 2005. According to the model, the population is predicted to increase by n% every 18 months. What is the value of n?

A) 0.38

B) 1.04

C) 4

D) 6

11

$$2(kx - n) = -\frac{28}{15}x - \frac{36}{19}$$

In the given equation, k and n are constants and $n > 1$. The equation has no solution. What is the value of k?

12

A gift shop buys souvenirs at a wholesale price of 7.00 dollars each and resells them each at a retail price that is 290% of the wholesale price. At the end of the season, any remaining souvenirs are marked at a discounted price that is 80% off the retail price. What is the discounted price of each remaining souvenir, in dollars?

13

$$x^2 - 34x + c = 0$$

In the given equation, c is a constant. The equation has no real solutions if $c > n$. What is the least possible value of n?

14

Data set A consists of the heights of 75 buildings and has a mean of 32 meters. Data set B consists of the heights of 50 buildings and has a mean of 62 meters. Data set C consists of the heights of the 125 buildings from data sets A and B. What is the mean, in meters, of data set C?

15

The expression $4x^2 + bx - 45$, where b is a constant, can be rewritten as $(hx + k)(x + j)$, where h, k, and j are integer constants. Which of the following must be an integer?

A) $\frac{b}{h}$

B) $\frac{b}{k}$

C) $\frac{45}{h}$

D) $\frac{45}{k}$

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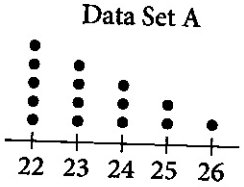
CONTINUE

16

$$y = -1.5$$
$$y = x^2 + 8x + a$$

In the given system of equations, a is a positive constant. The system has exactly one distinct real solution. What is the value of a?

17



The dot plot represents the 15 values in data set A. Data set B is created by adding 56 to each of the values in data set A. Which of the following correctly compares the medians and the ranges of data sets A and B?

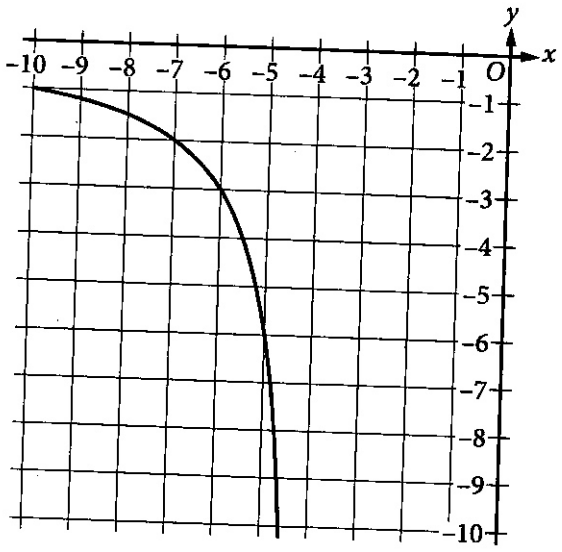
A) The median of data set B is equal to the median of data set A, and the range of data set B is equal to the range of data set A.

B) The median of data set B is equal to the median of data set A, and the range of data set B is greater than the range of data set A.

C) The median of data set B is greater than the median of data set A, and the range of data set B is equal to the range of data set A.

D) The median of data set B is greater than the median of data set A, and the range of data set B is greater than the range of data set A.

18



The rational function f is defined by an equation in the form $f(x) = \frac{a}{x+b}$ where a and b are constants. The partial graph of $y = f(x)$ is shown. If $g(x) = f(x + 4)$, which equation could define function g?

A) $g(x) = \frac{6}{x}$

B) $g(x) = \frac{6}{x+4}$

C) $g(x) = \frac{6}{x+8}$

D) $g(x) = \frac{6(x+4)}{x+4}$

19

$$57x^2 + (57b + a)x + ab = 0$$

In the given equation, a and b are positive constants. The product of the solutions to the given equation is kab, where k is a constant. What is the value of k?

A) $\frac{1}{57}$

B) $\frac{1}{19}$

C) 1

D) 57

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20

The graph of $x^2 + x + y^2 + y = \frac{199}{2}$ in the xy-plane is a circle. What is the length of the circle's radius?

21

Two identical rectangular prisms each have a height of 90 centimeters (cm). The base of each prism is a square, and the surface area of each prism is K cm^2. If the prisms are glued together along a square base, the resulting prism has a surface area of $\frac{92}{47}K$ cm^2. What is the side length, in cm, of each square base?

A) 4
B) 8
C) 9
D) 16

22

In the xy-plane, a parabola has vertex $(9, -14)$ and intersects the x-axis at two points. If the equation of the parabola is written in the form $y = ax^2 + bx + c$, where a, b, and c are constants, which of the following could be the value of $a + b + c$?

A) -23
B) -19
C) -14
D) -12

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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