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6TSL02

Test begins on the next page.

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

Former astronaut Ellen Ochoa says that although she doesn't have a definite idea of when it might happen, she _____ that humans will someday need to be able to live in other environments than those found on Earth. This conjecture informs her interest in future research missions to the moon.

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

A) demands
B) speculates
C) doubts
D) establishes

2

Beginning in the 1950s, Navajo Nation legislator Annie Dodge Wauneka continuously worked to promote public health; this _____ effort involved traveling throughout the vast Navajo homeland and writing a medical dictionary for speakers of *Diné bizaad*, the Navajo language.

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

A) impartial
B) offhand
C) persistent
D) mandatory

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CONTINUE

3

Following the principles of community-based participatory research, tribal nations and research institutions are equal partners in health studies conducted on reservations. A collaboration between the Crow Tribe and Montana State University _____ this model: tribal citizens worked alongside scientists to design the methodology and continue to assist in data collection.

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

A) circumvents
B) eclipses
C) fabricates
D) exemplifies

4

The parasitic dodder plant increases its reproductive success by flowering at the same time as the host plant it has latched onto. In 2020, Jianqiang Wu and his colleagues determined that the tiny dodder achieves this _____ with its host by absorbing and utilizing a protein the host produces when it is about to flower.

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

A) synchronization
B) hibernation
C) prediction
D) moderation

5

Given that the conditions in binary star systems should make planetary formation nearly impossible, it's not surprising that the existence of planets in such systems has lacked _____ explanation. Roman Rafikov and Kedron Silsbee shed light on the subject when they used modeling to determine a complex set of factors that could support planets' development.

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

A) a discernible
B) a straightforward
C) an inconclusive
D) an unbiased

6

Seminole/Muscogee director Sterlin Harjo _____ television's tendency to situate Native characters in the distant past: this rejection is evident in his series *Reservation Dogs*, which revolves around teenagers who dress in contemporary styles and whose dialogue is laced with current slang.

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

A) repudiates
B) proclaims
C) foretells
D) recants

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CONTINUE

7

In 2007, computer scientist Luis von Ahn was working on converting printed books into a digital format. He found that some words were distorted enough that digital scanners couldn't recognize them, but most humans could easily read them. Based on that finding, von Ahn invented a simple security test to keep automated "bots" out of websites. The first version of the reCAPTCHA test asked users to type one known word and one of the many words scanners couldn't recognize. Correct answers proved the users were humans and added data to the book-digitizing project.

Which choice best states the main purpose of the text?

A) To discuss von Ahn's invention of reCAPTCHA

B) To explain how digital scanners work

C) To call attention to von Ahn's book-digitizing project

D) To indicate how popular reCAPTCHA is

8

The following text is from Edith Wharton's 1905 novel *The House of Mirth*. Lily Bart and a companion are walking through a park.

> Lily had no real intimacy with nature, but she had a passion for the appropriate and could be keenly sensitive to a scene which was the fitting background of her own sensations. The landscape outspread below her seemed an enlargement of her present mood, and she found something of herself in its calmness, its breadth, its long free reaches. On the nearer slopes the sugar-maples wavered like pyres of light; lower down was a massing of grey orchards, and here and there the lingering green of an oak-grove.

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

A) It creates a detailed image of the physical setting of the scene.

B) It establishes that a character is experiencing an internal conflict.

C) It makes an assertion that the next sentence then expands on.

D) It illustrates an idea that is introduced in the previous sentence.

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CONTINUE

9

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

10

The following text is adapted from Edith Nesbit's 1906 novel *The Railway Children*.

> Mother did not spend all her time in paying dull [visits] to dull ladies, and sitting dully at home waiting for dull ladies to pay [visits] to her. She was almost always there, ready to play with the children, and read to them, and help them to do their home-lessons. Besides this she used to write stories for them while they were at school, and read them aloud after tea, and she always made up funny pieces of poetry for their birthdays and for other great occasions.

According to the text, what is true about Mother?

A) She wishes that more ladies would visit her.

B) Birthdays are her favorite special occasion.

C) She creates stories and poems for her children.

D) Reading to her children is her favorite activity.

11

The following text is from Maggie Pogue Johnson's 1910 poem "Poet of Our Race." In this poem, the speaker is addressing Paul Laurence Dunbar, a Black author.

> Thou, with stroke of mighty pen,
> Hast told of joy and mirth,
> And read the hearts and souls of men
> As cradled from their birth.
> The language of the flowers,
> Thou hast read them all,
> And e'en the little brook
> Responded to thy call.

Which choice best states the main purpose of the text?

A) To praise a certain writer for being especially perceptive regarding people and nature

B) To establish that a certain writer has read extensively about a variety of topics

C) To call attention to a certain writer's careful and elaborately detailed writing process

D) To recount fond memories of an afternoon spent in nature with a certain writer

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CONTINUE

12

"To You" is an 1856 poem by Walt Whitman. In the poem, Whitman suggests that readers, whom he addresses directly, have not fully understood themselves, writing, _____

Which quotation from "To You" most effectively illustrates the claim?

A) "You have not known what you are, you have slumber'd upon yourself / all your life, / Your eyelids have been the same as closed most of the time."

B) "These immense meadows, these interminable rivers, you are immense / and interminable as they."

C) "I should have made my way straight to you long ago, / I should have blabb'd nothing but you, I should have chanted nothing / but you."

D) "I will leave all and come and make the hymns of you, / None has understood you, but I understand you."

13

Born in 1891 to a Quechua-speaking family in the Andes Mountains of Peru, Martín Chambi is today considered to be one of the most renowned figures of Latin American photography. In a paper for an art history class, a student claims that Chambi's photographs have considerable ethnographic value—in his work, Chambi was able to capture diverse elements of Peruvian society, representing his subjects with both dignity and authenticity.

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

A) Chambi took many commissioned portraits of wealthy Peruvians, but he also produced hundreds of images carefully documenting the peoples, sites, and customs of Indigenous communities of the Andes.

B) Chambi's photographs demonstrate a high level of technical skill, as seen in his strategic use of illumination to create dramatic light and shadow contrasts.

C) During his lifetime, Chambi was known and celebrated both within and outside his native Peru, as his work was published in places like Argentina, Spain, and Mexico.

D) Some of the peoples and places Chambi photographed had long been popular subjects for Peruvian photographers.

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CONTINUE

14

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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CONTINUE

15

Juvenile Plants Found Growing on Bare Ground and in Patches of Vegetation for Five Species

Species	Bare ground	Patches of vegetation	Total	Percent found in patches of vegetation
T. moroderi	9	13	22	59.1%
T. libanitis	83	120	203	59.1%
H. syriacim	95	106	201	52.7%
H. squamatum	218	321	539	59.6%
H. stoechas	11	12	23	52.2%

Alicia Montesinos-Navarro, Isabelle Storer, and Rocío Perez-Barrales recently examined several plots within a diverse plant community in southeast Spain. The researchers calculated that if individual plants were randomly distributed on this particular landscape, only about 15% would be with other plants in patches of vegetation. They counted the number of juvenile plants of five species growing in patches of vegetation and the number growing alone on bare ground and compared those numbers to what would be expected if the plants were randomly distributed. Based on these results, they claim that plants of these species that grow in close proximity to other plants gain an advantage at an early developmental stage.

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

A) For all five species, less than 75% of juvenile plants were growing in patches of vegetation.

B) The species with the greatest number of juvenile plants growing in patches of vegetation was *H. stoechas*.

C) For *T. libanitis* and *T. moroderi*, the percentage of juvenile plants growing in patches of vegetation was less than what would be expected if plants were randomly distributed.

D) For each species, the percentage of juvenile plants growing in patches of vegetation was substantially higher than what would be expected if plants were randomly distributed.

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CONTINUE

16

In the mountains of Brazil, *Barbacenia tomentosa* and *Barbacenia macrantha*—two plants in the Velloziaceae family—establish themselves on soilless, nutrient-poor patches of quartzite rock. Plant ecologists Anna Abrahão and Patricia de Britto Costa used microscopic analysis to determine that the roots of *B. tomentosa* and *B. macrantha*, which grow directly into the quartzite, have clusters of fine hairs near the root tip; further analysis indicated that these hairs secrete both malic and citric acids. The researchers hypothesize that the plants depend on dissolving underlying rock with these acids, as the process not only creates channels for continued growth but also releases phosphates that provide the vital nutrient phosphorus.

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

A) Other species in the Velloziaceae family are found in terrains with more soil but have root structures similar to those of *B. tomentosa* and *B. macrantha*.

B) Though *B. tomentosa* and *B. macrantha* both secrete citric and malic acids, each species produces the acids in different proportions.

C) The roots of *B. tomentosa* and *B. macrantha* carve new entry points into rocks even when cracks in the surface are readily available.

D) *B. tomentosa* and *B. macrantha* thrive even when transferred to the surfaces of rocks that do not contain phosphates.

17

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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CONTINUE

18

In documents called judicial opinions, judges explain the reasoning behind their legal rulings, and in those explanations they sometimes cite and discuss historical and contemporary philosophers. Legal scholar and philosopher Anita L. Allen argues that while judges are naturally inclined to mention philosophers whose views align with their own positions, the strongest judicial opinions consider and rebut potential objections; discussing philosophers whose views conflict with judges' views could therefore _____

Which choice most logically completes the text?

A) allow judges to craft judicial opinions without needing to consult philosophical works.

B) help judges improve the arguments they put forward in their judicial opinions.

C) make judicial opinions more comprehensible to readers without legal or philosophical training.

D) bring judicial opinions in line with views that are broadly held among philosophers.

19

Public-awareness campaigns about the need to reduce single-use plastics can be successful, says researcher Kim Borg of Monash University in Australia, when these campaigns give consumers a choice: for example, Japan achieved a 40 percent reduction in plastic-bag use after cashiers were instructed to ask customers whether _____ wanted a bag.

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

A) they

B) one

C) you

D) it

20

In ancient Greece, an Epicurean was a follower of Epicurus, a philosopher whose beliefs revolved around the pursuit of pleasure. Epicurus defined pleasure as "the absence of pain in the body and of trouble in the _____ that all life's virtues derived from this absence.

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

A) soul," positing

B) soul": positing

C) soul"; positing

D) soul." Positing

21

British scientists James Watson and Francis Crick won the Nobel Prize in part for their 1953 paper announcing the double helix structure of DNA, but it is misleading to say that Watson and Crick discovered the double helix. _____ findings were based on a famous X-ray image of DNA fibers, "Photo 51," developed by X-ray crystallographer Rosalind Franklin and her graduate student Raymond Gosling.

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

A) They're

B) It's

C) Their

D) Its

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CONTINUE

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

In 1637, the price of tulips skyrocketed in Amsterdam, with single bulbs of rare varieties selling for up to the equivalent of $200,000 in today's US dollars. Some historians _____ that this "tulip mania" was the first historical instance of an asset bubble, which occurs when investors drive prices to highs not supported by actual demand.

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

A) claiming
B) claim
C) having claimed
D) to claim

24

Researchers studying magnetosensation have determined why some soil-dwelling roundworms in the Southern Hemisphere move in the opposite direction of Earth's magnetic field when searching for _____ in the Northern Hemisphere, the magnetic field points down, into the ground, but in the Southern Hemisphere, it points up, toward the surface and away from worms' food sources.

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

A) food:
B) food,
C) food while
D) food

25

Scientists believe that, unlike most other species of barnacle, turtle barnacles (*Chelonibia testudinari*) can dissolve the cement-like secretions they use to attach _____ to a sea turtle shell, enabling the barnacles to move short distances across the shell's surface.

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

A) it
B) themselves
C) them
D) itself

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CONTINUE

26

The classic children's board game Chutes and Ladders is a version of an ancient Nepalese game, Paramapada Sopanapata. In both games, players encounter "good" or "bad" spaces while traveling along a path; landing on one of the good spaces _____ a player to skip ahead and arrive closer to the end goal.

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

A) allows
B) are allowing
C) have allowed
D) allow

27

In 1943, in the midst of World War II, mathematics professor Grace Hopper was recruited by the US military to help the war effort by solving complex equations. Hopper's subsequent career would involve more than just _____ as a pioneering computer programmer, Hopper would help usher in the digital age.

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

A) equations, though:
B) equations, though,
C) equations. Though,
D) equations though

28

In 1453, English King Henry VI became unfit to rule after falling gravely ill. As a result, Parliament appointed Richard, Third Duke of York, who had a strong claim to the English throne, to rule as Lord Protector. Upon recovering two years later, _____ forcing an angered Richard from the royal court and precipitating a series of battles later known as the Wars of the Roses.

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

A) Henry resumed his reign,
B) the reign of Henry resumed,
C) Henry's reign resumed,
D) it was Henry who resumed his reign,

29

Although novels and poems are considered distinct literary forms, many authors have created hybrid works that incorporate elements of both. Bernardine Evaristo's *The Emperor's Babe*, _____ is a verse novel, a book-length narrative complete with characters and a plot but conveyed in short, crisp lines of poetry rather than prose.

Which choice completes the text with the most logical transition?

A) by contrast,
B) consequently,
C) secondly,
D) for example,

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CONTINUE

30

At two weeks old, the time their critical socialization period begins, wolves can smell but cannot yet see or hear. Domesticated dogs, _____ can see, hear, and smell by the end of two weeks. This relative lack of sensory input may help explain why wolves behave so differently around humans than dogs do: from a very young age, wolves are more wary and less exploratory.

Which choice completes the text with the most logical transition?

A) in other words,
B) for instance,
C) by contrast,
D) accordingly,

31

Researchers Helena Mihaljević-Brandt, Lucía Santamaría, and Marco Tullney report that while mathematicians may have traditionally worked alone, evidence points to a shift in the opposite direction. _____ mathematicians are choosing to collaborate with their peers—a trend illustrated by a rise in the number of mathematics publications credited to multiple authors.

Which choice completes the text with the most logical transition?

A) Similarly,
B) For this reason,
C) Furthermore,
D) Increasingly,

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CONTINUE

32

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.

33

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

- African American women played prominent roles in the Civil Rights Movement, including at the famous 1963 March on Washington.
- Civil rights activist Anna Hedgeman, one of the march's organizers, was a political adviser who had worked for President Truman.
- Civil rights activist Daisy Bates was a well-known journalist and advocate for school desegregation.
- Hedgeman worked behind the scenes to make sure a woman was included in the lineup of speakers at the march.
- Bates was the sole woman to speak, delivering a brief but memorable address to the cheering crowd.

The student wants to compare the two women's contributions to the March on Washington. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) Hedgeman and Bates contributed to the march in different ways; Bates, for example, delivered a brief but memorable address.

B) Hedgeman worked in politics and helped organize the march, while Bates was a journalist and school desegregation advocate.

C) Although Hedgeman worked behind the scenes to make sure a woman speaker was included, Bates was the sole woman to speak at the march.

D) Many African American women, including Bates and Hedgeman, fought for civil rights, but only one spoke at the march.

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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No Test Material On This Page

Reading and Writing

33 QUESTIONS

DIRECTIONS

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

1

For painter Jacob Lawrence, being _____ was an important part of the artistic process. Because he paid close attention to all the details of his Harlem neighborhood, Lawrence's artwork captured nuances in the beauty and vitality of the Black experience during the Harlem Renaissance and the Great Migration.

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

A) skeptical
B) observant
C) critical
D) confident

2

Mônica Lopes-Ferreira and others at Brazil's Butantan Institute are studying the freshwater stingray species *Potamotrygon rex* to determine whether biological characteristics such as the rays' age and sex have _____ effect on the toxicity of their venom—that is, to see if differences in these traits are associated with considerable variations in venom potency.

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

A) a disconcerting
B) an acceptable
C) an imperceptible
D) a substantial

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CONTINUE

3

Researchers have struggled to pinpoint specific causes for hiccups, which happen when a person's diaphragm contracts _____ . However, neuroscientist Kimberley Whitehead has found that these uncontrollable contractions may play an important role in helping infants regulate their breathing.

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

A) involuntarily
B) beneficially
C) strenuously
D) smoothly

4

Critics have asserted that fine art and fashion rarely _____ in a world where artists create timeless works for exhibition and designers periodically produce new styles for the public to buy. Luiseño/Shoshone-Bannock beadwork artist and designer Jamie Okuma challenges this view: her work can be seen in the Metropolitan Museum of Art and purchased through her online boutique.

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

A) prevail
B) succumb
C) diverge
D) intersect

5

Scholarly discussions of gender in Shakespeare's comedies often celebrate the rebellion of the playwright's characters against the rigid expectations _____ by Elizabethan society. Most of the comedies end in marriage, with characters returning to their socially dictated gender roles after previously defying them, but there are some notable exceptions.

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

A) interjected
B) committed
C) illustrated
D) prescribed

6

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

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CONTINUE

7

The province of Xoconochco was situated on the Pacific coast, hundreds of kilometers southeast of Tenochtitlan, the capital of the Aztec Empire. Because Xoconochco's location within the empire was so _____ , cacao and other trade goods produced there could reach the capital only after a long overland journey.

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

A) unobtrusive

B) concealed

C) approximate

D) peripheral

8

The following text is from Charlotte Brontë's 1847 novel *Jane Eyre*. Jane 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

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CONTINUE

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.

10

The following text is adapted from William Shakespeare's 1609 poem "Sonnet 27." The poem is addressed to a close friend as if he were physically present.

> Weary with toil, I [hurry] to my bed,
> The dear repose for limbs with travel tired;
> But then begins a journey in my head
> To work my mind, when body's work's expired:
> For then my thoughts—from far where I abide—
> [Begin] a zealous pilgrimage to thee,
> And keep my drooping eyelids open wide,

What is the main idea of the text?

A) The speaker is asleep and dreaming about traveling to see the friend.

B) The speaker is planning an upcoming trip to the friend's house.

C) The speaker is too fatigued to continue a discussion with the friend.

D) The speaker is thinking about the friend instead of immediately falling asleep.

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CONTINUE

11

The following text is adapted from Lewis Carroll's 1889 satirical novel *Sylvie and Bruno*. A crowd has gathered outside a room belonging to the Warden, an official who reports to the Lord Chancellor.

> One man, who was more excited than the rest, flung his hat high into the air, and shouted (as well as I could make out) "Who roar for the Sub-Warden?" Everybody roared, but whether it was for the Sub-Warden, or not, did not clearly appear: some were shouting "Bread!" and some "Taxes!", but no one seemed to know what it was they really wanted.
>
> All this I saw from the open window of the Warden's breakfast-saloon, looking across the shoulder of the Lord Chancellor.
>
> "What can it all mean?" he kept repeating to himself. "I never heard such shouting before—and at this time of the morning, too! And with such unanimity!"

Based on the text, how does the Lord Chancellor respond to the crowd?

A) He asks about the meaning of the crowd's shouting, even though he claims to know what the crowd wants.

B) He indicates a desire to speak to the crowd, even though the crowd has asked to speak to the Sub-Warden.

C) He expresses sympathy for the crowd's demands, even though the crowd's shouting annoys him.

D) He describes the crowd as being united, even though the crowd clearly appears otherwise.

12

O Pioneers! is a 1913 novel by Willa Cather. In the novel, Cather portrays Alexandra Bergson as having a deep emotional connection to her natural surroundings: _____

Which quotation from *O Pioneers!* most effectively illustrates the claim?

A) "She had never known before how much the country meant to her. The chirping of the insects down in the long grass had been like the sweetest music. She had felt as if her heart were hiding down there, somewhere, with the quail and the plover and all the little wild things that crooned or buzzed in the sun. Under the long shaggy ridges, she felt the future stirring."

B) "Alexandra talked to the men about their crops and to the women about their poultry. She spent a whole day with one young farmer who had been away at school, and who was experimenting with a new kind of clover hay. She learned a great deal."

C) "Alexandra drove off alone. The rattle of her wagon was lost in the howling of the wind, but her lantern, held firmly between her feet, made a moving point of light along the highway, going deeper and deeper into the dark country."

D) "It was Alexandra who read the papers and followed the markets, and who learned by the mistakes of their neighbors. It was Alexandra who could always tell about what it had cost to fatten each steer, and who could guess the weight of a hog before it went on the scales closer than John Bergson [her father] himself."

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CONTINUE

13

Approximate Rates of Speech and Information Conveyed for Five Languages

Language	Rate of speech (syllables per second)	Rate of information conveyed (bits per second)
Serbian	7.2	39.1
Spanish	7.7	42.0
Vietnamese	5.3	42.5
Thai	4.7	33.8
Hungarian	5.9	34.6

A group of researchers working in Europe, Asia, and Oceania conducted a study to determine how quickly different Eurasian languages are typically spoken (in syllables per second) and how much information they can effectively convey (in bits per second). They found that, although languages vary widely in the speed at which they are spoken, the amount of information languages can effectively convey tends to vary much less. Thus, they claim that two languages with very different spoken rates can nonetheless convey the same amount of information in a given amount of time.

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

A) Among the five languages in the table, Thai and Hungarian have the lowest rates of speech and the lowest rates of information conveyed.

B) Vietnamese conveys information at approximately the same rate as Spanish despite being spoken at a slower rate.

C) Among the five languages in the table, the language that is spoken the fastest is also the language that conveys information the fastest.

D) Serbian and Spanish are spoken at approximately the same rate, but Serbian conveys information faster than Spanish does.

14

Psychologists Dacher Keltner and Jonathan Haidt have argued that experiencing awe—a sensation of reverence and wonder typically brought on by perceiving something grand or powerful—can enable us to feel more connected to others and thereby inspire us to act more altruistically. Keltner, along with Paul K. Piff, Pia Dietze, and colleagues, claims to have found evidence for this effect in a recent study where participants were asked to either gaze up at exceptionally tall trees in a nearby grove (reported to be a universally awe-inspiring experience) or stare at the exterior of a nearby, nondescript building. After one minute, an experimenter deliberately spilled a box of pens nearby.

Which finding from the researchers' study, if true, would most strongly support their claim?

A) Participants who had been looking at the trees helped the experimenter pick up significantly more pens than did participants who had been looking at the building.

B) Participants who helped the experimenter pick up the pens used a greater number of positive words to describe the trees and the building in a postexperiment survey than did participants who did not help the experimenter.

C) Participants who did not help the experimenter pick up the pens were significantly more likely to report having experienced a feeling of awe, regardless of whether they looked at the building or the trees.

D) Participants who had been looking at the building were significantly more likely to notice that the experimenter had dropped the pens than were participants who had been looking at the trees.

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CONTINUE

15

Employment by Sector in France and the United States, 1800–2012
(% of total employment)

Year	Agriculture in France	Manufacturing in France	Services in France	Agriculture in US	Manufacturing in US	Services in US
1800	64	22	14	68	18	13
1900	43	29	28	41	28	31
1950	32	33	35	14	33	53
2012	3	21	76	2	18	80

Rows in table may not add up to 100 due to rounding.

Over the past two hundred years, the percentage of the population employed in the agricultural sector has declined in both France and the United States, while employment in the service sector (which includes jobs in retail, consulting, real estate, etc.) has risen. However, this transition happened at very different rates in the two countries. This can be seen most clearly by comparing the employment by sector in both countries in _____

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

A) 1900 with the employment by sector in 1950.

B) 1800 with the employment by sector in 2012.

C) 1900 with the employment by sector in 2012.

D) 1800 with the employment by sector in 1900.

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CONTINUE

16

Many archaeologists will tell you that categorizing excavated fragments of pottery by style, period, and what objects they belong to relies not only on standard criteria, but also on instinct developed over years of practice. In a recent study, however, researchers trained a deep-learning computer model on thousands of images of pottery fragments and found that it could categorize them as accurately as a team of expert archaeologists. Some archaeologists have expressed concern that they might be replaced by such computer models, but the researchers claim that outcome is highly unlikely.

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

A) In the researchers' study, the model was able to categorize the pottery fragments much more quickly than the archaeologists could.

B) In the researchers' study, neither the model nor the archaeologists were able to accurately categorize all the pottery fragments that were presented.

C) A survey of archaeologists showed that categorizing pottery fragments limits the amount of time they can dedicate to other important tasks that only human experts can do.

D) A survey of archaeologists showed that few of them received dedicated training in how to properly categorize pottery fragments.

17

Although military veterans make up a small proportion of the total population of the United States, they occupy a significantly higher proportion of the jobs in the civilian government. One possible explanation for this disproportionate representation is that military service familiarizes people with certain organizational structures that are also reflected in the civilian government bureaucracy, and this familiarity thus _____

Which choice most logically completes the text?

A) makes civilian government jobs especially appealing to military veterans.

B) alters the typical relationship between military service and subsequent career preferences.

C) encourages nonveterans applying for civilian government jobs to consider military service instead.

D) increases the number of civilian government jobs that require some amount of military experience to perform.

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CONTINUE

18

Birds of many species ingest foods containing carotenoids, pigmented molecules that are converted into feather coloration. Coloration tends to be especially saturated in male birds' feathers, and because carotenoids also confer health benefits, the deeply saturated colors generally serve to communicate what is known as an honest signal of a bird's overall fitness to potential mates. However, ornithologist Allison J. Shultz and others have found that males in several species of the tanager genus *Ramphocelus* use microstructures in their feathers to manipulate light, creating the appearance of deeper saturation without the birds necessarily having to maintain a carotenoid-rich diet. These findings suggest that _____

Which choice most logically completes the text?

A) individual male tanagers can engage in honest signaling without relying on carotenoid consumption.

B) feather microstructures may be less effective than deeply saturated feathers for signaling overall fitness.

C) scientists have yet to determine why tanagers have a preference for mates with colorful appearances.

D) a male tanager's appearance may function as a dishonest signal of the individual's overall fitness.

19

When writing *The Other Black Girl* (2021), novelist Zakiya Dalila Harris drew on her own experiences working at a publishing office. The award-winning book is Harris's first novel, but her writing _____ honored before. At the age of twelve, she entered a contest to have a story published in *American Girl* magazine—and won.

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

A) were

B) have been

C) has been

D) are

20

The Alvarez theory, developed in 1980 by physicist Luis Walter Alvarez and his geologist son Walter Alvarez, maintained that the secondary effects of an asteroid impact caused many dinosaurs and other animals to die _____ it left unexplored the question of whether unrelated volcanic activity might have also contributed to the mass extinctions.

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

A) out but

B) out, but

C) out

D) out,

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CONTINUE

21

In winter, the diets of Japanese macaques, also known as snow monkeys, are influenced more by food availability than by food preference. Although the monkeys prefer to eat vegetation and land-dwelling invertebrates, those food sources may become unavailable because of extensive snow and ice cover, _____ the monkeys to hunt for marine animals in any streams that have not frozen over.

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

A) forces
B) to force
C) forcing
D) forced

22

Lucía Michel of the University of Chile observed that alkaline soils contain an insoluble form of iron that blueberry plants cannot absorb, thus inhibiting blueberry growth. If these plants were grown in alkaline soil alongside grasses that aid in iron solubilization, _____ Michel was determined to find out.

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

A) could the blueberries thrive.
B) the blueberries could thrive.
C) the blueberries could thrive?
D) could the blueberries thrive?

23

In his 1963 exhibition *Exposition of Music—Electronic Television*, Korean American artist Nam June Paik showed how television images could be manipulated to express an artist's perspective. Today, Paik _____ considered the first video artist.

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

A) will be
B) had been
C) was
D) is

24

The first computerized spreadsheet, Dan Bricklin's *VisiCalc*, improved financial recordkeeping not only by providing users with an easy means of adjusting data in spreadsheets but also by automatically updating all calculations that were dependent on these _____ to VisiCalc's release, changing a paper spreadsheet often required redoing the entire sheet by hand, a process that could take days.

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

A) adjustments prior
B) adjustments, prior
C) adjustments. Prior
D) adjustments and prior

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CONTINUE

25

In order to prevent nonnative fish species from moving freely between the Mediterranean and Red Seas, marine biologist Bella Galil has proposed that a saline lock system be installed along the Suez Canal in Egypt's Great Bitter Lakes. The lock would increase the salinity of the lakes and _____ a natural barrier of water most marine creatures would be unable to cross.

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

A) creates
B) create
C) creating
D) created

26

Despite being cheap, versatile, and easy to produce, _____ they are made from nonrenewable petroleum, and most do not biodegrade in landfills.

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

A) there are two problems associated with commercial plastics:
B) two problems are associated with commercial plastics:
C) commercial plastics' two associated problems are that
D) commercial plastics have two associated problems:

27

Stomata, tiny pore structures in a leaf that absorb gases needed for plant growth, open when guard cells surrounding each pore swell with water. In a pivotal 2007 article, plant cell _____ showed that lipid molecules called phosphatidylinositol phosphates are responsible for signaling guard cells to open stomata.

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

A) biologist, Yuree Lee
B) biologist Yuree Lee,
C) biologist Yuree Lee
D) biologist, Yuree Lee,

28

Small, flat structures called spatulae are found at the tips of the hairs on a spider's leg. These spatulae temporarily bond with the atoms of whatever they touch. _____ spiders are able to cling to and climb almost any surface.

Which choice completes the text with the most logical transition?

A) For instance,
B) However,
C) Similarly,
D) As a result,

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CONTINUE

29

In November 1934, Amrita Sher-Gil was living in what must have seemed like the ideal city for a young artist: Paris. She was studying firsthand the color-saturated style of France's modernist masters and beginning to make a name for herself as a painter. _____ Sher-Gil longed to return to her childhood home of India; only there, she believed, could her art truly flourish.

Which choice completes the text with the most logical transition?

A) Still,

B) Therefore,

C) Indeed,

D) Furthermore,

30

Before California's 1911 election to approve a proposition granting women the right to vote, activists across the state sold tea to promote the cause of suffrage. In San Francisco, the Woman's Suffrage Party sold Equality Tea at local fairs. _____ in Los Angeles, activist Nancy Tuttle Craig, who ran one of California's largest grocery store firms, distributed Votes for Women Tea.

Which choice completes the text with the most logical transition?

A) For example,

B) To conclude,

C) Similarly,

D) In other words,

31

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

- The Seikan Tunnel is a rail tunnel in Japan.
- It connects the island of Honshu to the island of Hokkaido.
- It is roughly 33 miles long.
- The Channel Tunnel is a rail tunnel in Europe.
- It connects Folkestone, England, to Coquelles, France.
- It is about 31 miles long.

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

A) Some of the world's rail tunnels, including one tunnel that extends from Folkestone, England, to Coquelles, France, are longer than 30 miles.

B) The Seikan Tunnel is roughly 33 miles long, while the slightly shorter Channel Tunnel is about 31 miles long.

C) The Seikan Tunnel, which is roughly 33 miles long, connects the Japanese islands of Honshu and Hokkaido.

D) Both the Seikan Tunnel, which is located in Japan, and the Channel Tunnel, which is located in Europe, are examples of rail tunnels.

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CONTINUE

32

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

- Jon Ching is a Los Angeles-based painter.
- He uses the term "flauna" to describe the plant-animal hybrids that he depicts in his surreal paintings.
- "Flauna" is a combination of the words "flora" and "fauna."
- His painting *Nectar* depicts a parrot with leaves for feathers.
- His painting *Primaveral* depicts a snow leopard whose fur sprouts flowers.

The student wants to provide an explanation and example of "flauna." Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) The term "flauna," used by Los Angeles-based painter Jon Ching, is a combination of the words "flora" and "fauna."

B) Jon Ching uses the term "flauna," a combination of the words "flora" and "fauna," to describe the subjects of his surreal paintings: plant-animal hybrids such as a parrot with leaves for feathers.

C) Jon Ching, who created *Nectar*, refers to the subjects of his paintings as "flauna."

D) The subjects of *Nectar* and *Primaveral* are types of "flauna," a term that the paintings' creator, Jon Ching, uses when describing his surreal artworks.

33

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

- In the midst of the US Civil War, Susie Taylor escaped slavery and fled to Union-army-occupied St. Simons Island off the Georgia coast.
- She began working for an all-Black army regiment as a nurse and teacher.
- In 1902, she published a book about the time she spent with the regiment.
- Her book was the only Civil War memoir to be published by a Black woman.
- It is still available to readers in print and online.

The student wants to emphasize the uniqueness of Taylor's accomplishment. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) Taylor fled to St. Simons Island, which was then occupied by the Union army, for whom she began working.

B) After escaping slavery, Taylor began working for an all-Black army regiment as a nurse and teacher.

C) The book Taylor wrote about the time she spent with the regiment is still available to readers in print and online.

D) Taylor was the only Black woman to publish a Civil War memoir.

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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No Test Material On This Page

Math

27 QUESTIONS

DIRECTIONS

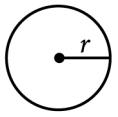
The questions in this section address a number of important math skills.
Use of a calculator is permitted for all questions.

NOTES

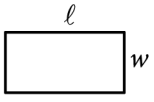
Unless otherwise indicated:

- 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.

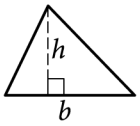
REFERENCE



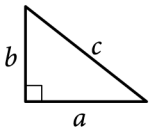
$A = \pi r^2$
$C = 2\pi r$



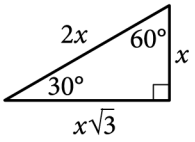
$A = \ell w$

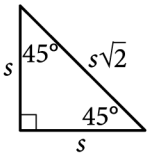


$A = \frac{1}{2}bh$

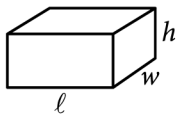


$c^2 = a^2 + b^2$

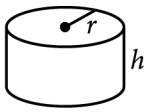




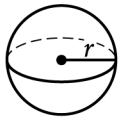
Special Right Triangles



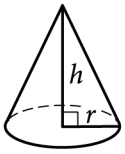
$V = \ell wh$



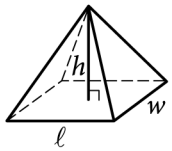
$V = \pi r^2 h$



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



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



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

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

What is 10% of 470?

A) 37

B) 47

C) 423

D) 460

2

$$4x + 6 = 18$$

Which equation has the same solution as the given equation?

A) $4x = 108$

B) $4x = 24$

C) $4x = 12$

D) $4x = 3$

3

The total cost, in dollars, to rent a surfboard consists of a \$25 service fee and a \$10 per hour rental fee. A person rents a surfboard for t hours and intends to spend a maximum of \$75 to rent the surfboard. Which inequality represents this situation?

A) $10t \leq 75$

B) $10 + 25t \leq 75$

C) $25t \leq 75$

D) $25 + 10t \leq 75$

4

The function g is defined by $g(x) = x^2 + 9$. For which value of x is $g(x) = 25$?

A) 4

B) 5

C) 9

D) 13

5

Each face of a fair 14-sided die is labeled with a number from 1 through 14, with a different number appearing on each face. If the die is rolled one time, what is the probability of rolling a 2?

A) $\frac{1}{14}$

B) $\frac{2}{14}$

C) $\frac{12}{14}$

D) $\frac{13}{14}$

6

A printer produces posters at a constant rate of 42 posters per minute. At what rate, in posters per hour, does the printer produce the posters?

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CONTINUE

7

The function f is defined by the equation $f(x) = 7x + 2$. What is the value of $f(x)$ when $x = 4$?

8

A teacher is creating an assignment worth 70 points. The assignment will consist of questions worth 1 point and questions worth 3 points. Which equation represents this situation, where x represents the number of 1-point questions and y represents the number of 3-point questions?

A) $4xy = 70$

B) $4(x + y) = 70$

C) $3x + y = 70$

D) $x + 3y = 70$

9

Right triangles LMN and PQR are similar, where L and M correspond to P and Q, respectively. Angle M has a measure of 53°. What is the measure of angle Q ?

A) 37°

B) 53°

C) 127°

D) 143°

10

$$y = -3x$$
$$4x + y = 15$$

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

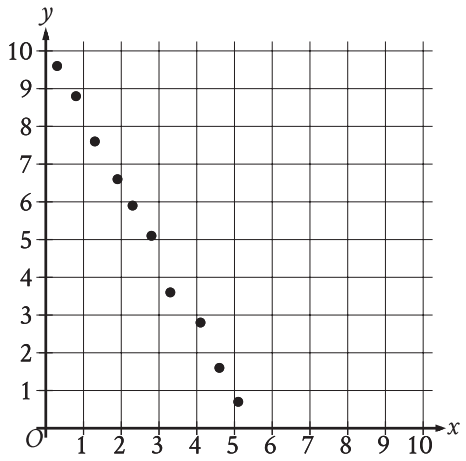
A) 1

B) 5

C) 15

D) 45

11



Which of the following equations is the most appropriate linear model for the data shown in the scatterplot?

A) $y = -1.9x - 10.1$

B) $y = -1.9x + 10.1$

C) $y = 1.9x - 10.1$

D) $y = 1.9x + 10.1$

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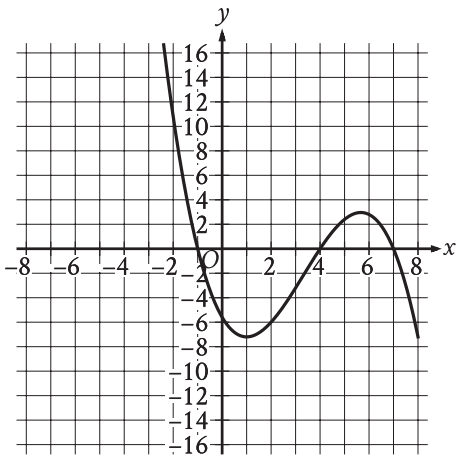
CONTINUE

12



The graph of $y = f(x)$ is shown, where the function f is defined by $f(x) = ax^3 + bx^2 + cx + d$ and a, b, c, and d are constants. For how many values of x does $f(x) = 0$?

A) One

B) Two

C) Three

D) Four

13

Vivian bought party hats and cupcakes for $71. Each package of party hats cost $3, and each cupcake cost $1. If Vivian bought 10 packages of party hats, how many cupcakes did she buy?

14

$$z^2 + 10z - 24 = 0$$

What is one of the solutions to the given equation?

15

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

16

Which expression is equivalent to $6x^8y^2 + 12x^2y^2$?

A) $6x^2y^2(2x^6)$

B) $6x^2y^2(x^4)$

C) $6x^2y^2(x^6 + 2)$

D) $6x^2y^2(x^4 + 2)$

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CONTINUE

17

A neighborhood consists of a 2-hectare park and a 35-hectare residential area. The total number of trees in the neighborhood is 3,934. The equation $2x + 35y = 3{,}934$ represents this situation. Which of the following is the best interpretation of x in this context?

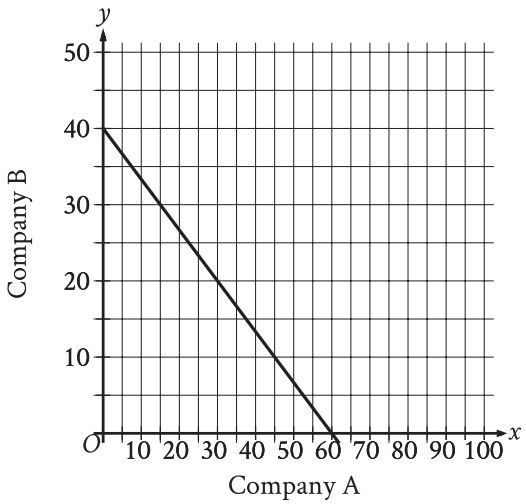
A) The average number of trees per hectare in the park

B) The average number of trees per hectare in the residential area

C) The total number of trees in the park

D) The total number of trees in the residential area

18



The graph shows the relationship between the number of shares of stock from Company A, x, and the number of shares of stock from Company B, y, that Simone can purchase. Which equation could represent this relationship?

A) $y = 8x + 12$

B) $8x + 12y = 480$

C) $y = 12x + 8$

D) $12x + 8y = 480$

19

Circle A has a radius of $3n$ and circle B has a radius of $129n$, where n is a positive constant. The area of circle B is how many times the area of circle A?

A) 43

B) 86

C) 129

D) 1,849

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CONTINUE

20

Data value	Frequency
6	3
7	3
8	8
9	8
10	9
11	11
12	9
13	0
14	6

The frequency table summarizes the 57 data values in a data set. What is the maximum data value in the data set?

21

A circle in the xy-plane has a diameter with endpoints $(2, 4)$ and $(2, 14)$. An equation of this circle is $(x-2)^2 + (y-9)^2 = r^2$, where r is a positive constant. What is the value of r ?

22

The measure of angle R is $\frac{2\pi}{3}$ radians. The measure of angle T is $\frac{5\pi}{12}$ radians greater than the measure of angle R. What is the measure of angle T, in degrees?

A) 75
B) 120
C) 195
D) 390

23

A certain town has an area of 4.36 square miles. What is the area, in square yards, of this town? (1 mile = 1,760 yards)

A) 404
B) 7,674
C) 710,459
D) 13,505,536

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CONTINUE

24

x	y
18	130
23	160
26	178

For line h, the table shows three values of x and their corresponding values of y. Line k is the result of translating line h down 5 units in the xy-plane. What is the x-intercept of line k?

A) $\left(-\frac{26}{3}, 0\right)$

B) $\left(-\frac{9}{2}, 0\right)$

C) $\left(-\frac{11}{3}, 0\right)$

D) $\left(-\frac{17}{6}, 0\right)$

25

In the xy-plane, the graph of the equation $y = -x^2 + 9x - 100$ intersects the line $y = c$ at exactly one point. What is the value of c?

A) $-\frac{481}{4}$

B) -100

C) $-\frac{319}{4}$

D) $-\frac{9}{2}$

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CONTINUE

26

$$2x + 3y = 7$$
$$10x + 15y = 35$$

For each real number r, which of the following points lies on the graph of each equation in the xy-plane for the given system?

A) $\left(\frac{r}{5} + 7, -\frac{r}{5} + 35\right)$

B) $\left(-\frac{3r}{2} + \frac{7}{2}, r\right)$

C) $\left(r, \frac{2r}{3} + \frac{7}{3}\right)$

D) $\left(r, -\frac{3r}{2} + \frac{7}{2}\right)$

27

The perimeter of an equilateral triangle is 624 centimeters. The height of this triangle is $k\sqrt{3}$ centimeters, 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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No Test Material On This Page

Math

27 QUESTIONS

DIRECTIONS

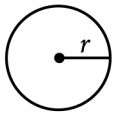
The questions in this section address a number of important math skills.
Use of a calculator is permitted for all questions.

NOTES

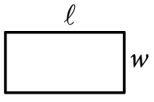
Unless otherwise indicated:

- 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.

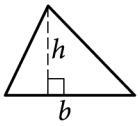
REFERENCE



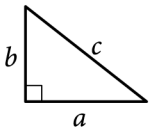
$A = \pi r^2$
$C = 2\pi r$



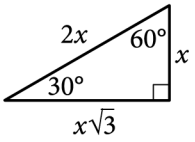
$A = \ell w$

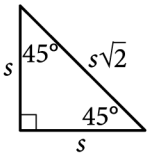


$A = \frac{1}{2}bh$

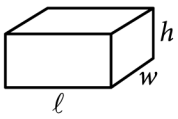


$c^2 = a^2 + b^2$

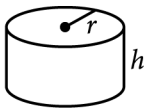




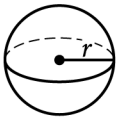
Special Right Triangles



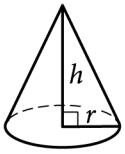
$V = \ell wh$



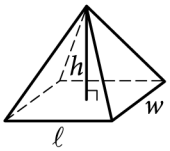
$V = \pi r^2 h$



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



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



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

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

Tilly earns p dollars for every w hours of work. Which expression represents the amount of money, in dollars, Tilly earns for $39w$ hours of work?

A) $39p$

B) $\frac{p}{39}$

C) $p + 39$

D) $p - 39$

2

For a training program, Juan rides his bike at an average rate of 5.7 minutes per mile. Which function m models the number of minutes it will take Juan to ride x miles at this rate?

A) $m(x) = \frac{x}{5.7}$

B) $m(x) = x + 5.7$

C) $m(x) = x - 5.7$

D) $m(x) = 5.7x$

3

$$3x = 12$$
$$-3x + y = -6$$

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

A) -3

B) 6

C) 18

D) 30

4

$$s = 40 + 3t$$

The equation gives the speed s, in miles per hour, of a certain car t seconds after it began to accelerate. What is the speed, in miles per hour, of the car 5 seconds after it began to accelerate?

A) 40

B) 43

C) 45

D) 55

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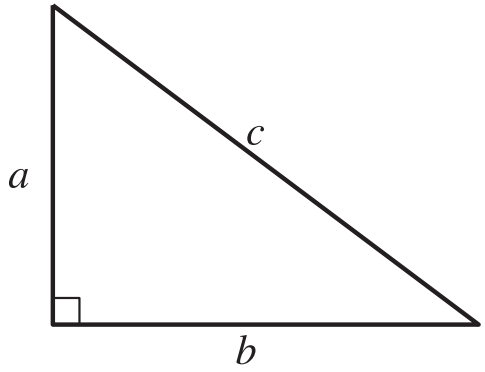
5



Note: Figure not drawn to scale.

For the right triangle shown, $a = 4$ and $b = 5$. Which expression represents the value of c ?

A) $4 + 5$

B) $\sqrt{(4)(5)}$

C) $\sqrt{4 + 5}$

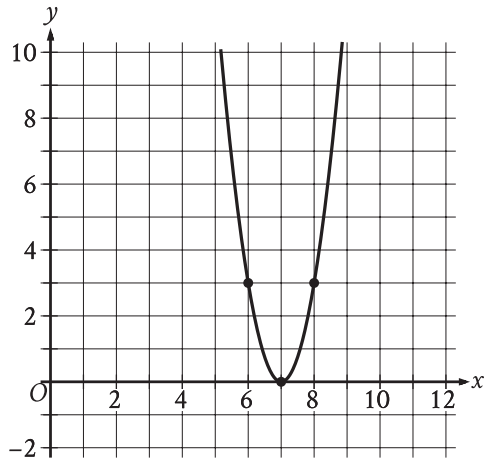
D) $\sqrt{4^2 + 5^2}$

6

$$4x + 5 = 165$$

What is the solution to the given equation?

7



The x-intercept of the graph shown is $(x, 0)$. What is the value of x ?

8

The function f is defined by $f(x) = \frac{1}{10}x - 2$. What is the y-intercept of the graph of $y = f(x)$ in the xy-plane?

A) $(-2, 0)$

B) $(0, -2)$

C) $\left(0, \frac{1}{10}\right)$

D) $\left(\frac{1}{10}, 0\right)$

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CONTINUE

9

The function f is defined by $f(x) = 7x^3$. In the xy-plane, the graph of $y = g(x)$ is the result of shifting the graph of $y = f(x)$ down 2 units. Which equation defines function g ?

A) $g(x) = \frac{7}{2}x^3$

B) $g(x) = 7x^{\frac{3}{2}}$

C) $g(x) = 7x^3 + 2$

D) $g(x) = 7x^3 - 2$

10

$$x + 7 = 10$$
$$(x + 7)^2 = y$$

Which ordered pair (x, y) is a solution to the given system of equations?

A) $(3, 100)$

B) $(3, 3)$

C) $(3, 10)$

D) $(3, 70)$

11

Which expression is equivalent to $(7x^3 + 7x) - (6x^3 - 3x)$?

A) $x^3 + 10x$

B) $-13x^3 + 10x$

C) $-13x^3 + 4x$

D) $x^3 + 4x$

12

The function p is defined by $p(n) = 7n^3$. What is the value of n when $p(n)$ is equal to 56?

A) 2

B) $\frac{8}{3}$

C) 7

D) 8

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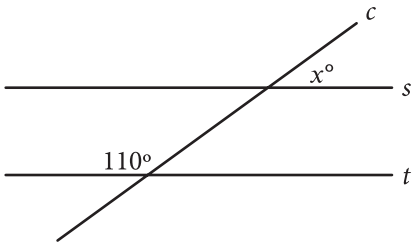
CONTINUE

13



Note: Figure not drawn to scale.

In the figure shown, line c intersects parallel lines s and t. What is the value of x ?

14

A list of 10 data values is shown.

6, 8, 16, 4, 17, 26, 8, 5, 5, 5

What is the mean of these data?

15

The equation $E(t) = 5(1.8)^t$ gives the estimated number of employees at a restaurant, where t is the number of years since the restaurant opened. Which of the following is the best interpretation of the number 5 in this context?

A) The estimated number of employees when the restaurant opened

B) The increase in the estimated number of employees each year

C) The number of years the restaurant has been open

D) The percent increase in the estimated number of employees each year

16

$$g(x) = x^2 + 55$$

What is the minimum value of the given function?

A) 0

B) 55

C) 110

D) 3,025

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CONTINUE

17

Each year, the value of an investment increases by 0.49% of its value the previous year. Which of the following functions best models how the value of the investment changes over time?

A) Decreasing exponential

B) Decreasing linear

C) Increasing exponential

D) Increasing linear

18

The population of Greenville 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

19

Which expression is equivalent to $a^{\frac{11}{12}}$,

where $a > 0$?

A) $\sqrt[12]{a^{132}}$

B) $\sqrt[144]{a^{132}}$

C) $\sqrt[121]{a^{132}}$

D) $\sqrt[11]{a^{132}}$

20

An event planner is planning a party. It costs the event planner a onetime fee of \$35 to rent the venue and \$10.25 per attendee. The event planner has a budget of \$200. What is the greatest number of attendees possible without exceeding the budget?

21

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

22

A cube has an edge length of 68 inches. A solid sphere with a radius of 34 inches is inside the cube, such that the sphere touches the center of each face of the cube. To the nearest cubic inch, what is the volume of the space in the cube not taken up by the sphere?

A) 149,796

B) 164,500

C) 190,955

D) 310,800

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CONTINUE

23

What is the diameter of the circle in the xy-plane with equation $(x - 5)^2 + (y - 3)^2 = 16$?

A) 4

B) 8

C) 16

D) 32

24

For the exponential function f, the value of $f(1)$ is k, where k is a constant. Which of the following equivalent forms of the function f shows the value of k as the coefficient or the base?

A) $f(x) = 50(1.6)^{x+1}$

B) $f(x) = 80(1.6)^{x}$

C) $f(x) = 128(1.6)^{x-1}$

D) $f(x) = 204.8(1.6)^{x-2}$

25

A model estimates that at the end of each year from 2015 to 2020, the number of squirrels in a population was 150% more than the number of squirrels in the population at the end of the previous year. The model estimates that at the end of 2016, there were 180 squirrels in the population. Which of the following equations represents this model, where n is the estimated number of squirrels in the population t years after the end of 2015 and $t \leq 5$?

A) $n = 72(1.5)^{t}$

B) $n = 72(2.5)^{t}$

C) $n = 180(1.5)^{t}$

D) $n = 180(2.5)^{t}$

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CONTINUE

26

$$5x + 7y = 1$$

$$ax + by = 1$$

In the given pair of equations, a and b are constants. The graph of this pair of equations in the xy-plane is a pair of perpendicular lines. Which of the following pairs of equations also represents a pair of perpendicular lines?

A) $10x + 7y = 1$
$ax - 2by = 1$

B) $10x + 7y = 1$
$ax + 2by = 1$

C) $10x + 7y = 1$
$2ax + by = 1$

D) $5x - 7y = 1$
$ax + by = 1$

27

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

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?

STOP

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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.
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