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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

The following text is from Meredith Nicholson's 1910 short story "The Girl with the Red Feather."

> Mrs. Webster G. Burgess always maintains that nothing her husband may do can shock her. When her husband had not appeared at seven she explained to her guest that he had been detained by an unexpected meeting of a clearing-house committee.

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

A) Developed
B) Responded
C) Arrived
D) Pretended

2

Wildfires likely never happened in Antarctica. That's what scientists used to think. But then a team of researchers discovered charcoal from the Cretaceous period in Antarctica. The team analyzed the charcoal and found that it likely came from a tree that burned in a fire. This suggests that wildfires may have indeed _____ in Antarctica millions of years ago.

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

A) returned
B) rotated
C) occurred
D) offended

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CONTINUE

3

Consumers usually _____ rising prices of nonessential products, such as video games or jewelry, by purchasing fewer of those products. When the prices fall, consumers usually react the opposite way, by purchasing more of those products.

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

A) differ from
B) respond to
C) think of
D) agree with

4

Japanese animator and director Hayao Miyazaki often includes fantasy elements in otherwise realistic settings in his movies, but he tends to _____ details and exposition about those elements. Miyazaki simply presents fantastical characters and actions with little backstory or explanation, encouraging viewers to embrace the presence of the extraordinary in everyday life.

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

A) withhold
B) celebrate
C) combine
D) invent

5

The following text is from Alice Wong's 2022 memoir *Year of the Tiger: An Activist's Life*. Wong has just described her tendency to procrastinate when she has a writing deadline.

> In the middle of these distractions, a vibe will emerge, a point I want to make, a phrase, a hook, a title for a story, an image. A connection or epiphany can happen while watching or reading something brilliant. By doing "nothing" and daydreaming, I am actually composing, even if words don't immediately materialize.

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Based on the text, what does Wong most likely mean when she states that she is "composing"?

A) She is deceiving herself about her true feelings about a subject.
B) She is engaging in an important part of her writing process.
C) She is being soothed by immersing herself in creative works by other people.
D) She is gathering sources of information to use in her writing.

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CONTINUE

6

In factories, humans and robots often work together. A research team ran an experiment to find out how working with robots affects relationships between human coworkers. The experiment included teams working together to make electric motor parts. One type of team included only humans and the other type included both humans and robots. Participants were paid for their work and were asked about their willingness to share their earnings with their human teammates. Participants from teams with robots were more likely to share with each other than participants from teams with only humans were.

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

A) It explains an important part of the design of the experiment discussed in the text.

B) It illustrates a problem that inspired the study discussed in the text.

C) It indicates the question that the study discussed in the text was meant to answer.

D) It states the results of the experiment discussed in the text.

7

Julie Dash's lyrical film *Daughters of the Dust*, first released in 1991, follows members of a Gullah family as they depart from their island home near Georgia in 1902. Though an imaginative, critically acclaimed film with a wide release—and a highly appreciative global audience—Dash's work never received the plaudits it deserved within the US film industry. Interest in the film reignited, however, with Beyoncé's release of *Lemonade* in 2016, due to the visual album's numerous allusions to Dash's film in the form of stylistic references to its scenes, costumes, and celebration of Black life in the US South.

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

A) It introduces the implication that had Dash's film received more recognition from the US film industry at the time of its release, it wouldn't have attained such influence on Beyoncé's *Lemonade*.

B) It expands on an attribute of Dash's film that is described earlier in the text in order to draw distinctions between the film and a later work that was influenced by it.

C) It presents a discrepancy between the value of Dash's film and the industry's response to it that the text goes on to demonstrate was partially rectified by the film's influence on a later work.

D) It gives a brief overview of how Dash's film was received at the time of release and alludes to the reception of a similar work that is described later in the text.

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CONTINUE

8

The following text is adapted from Henry James's 1916 short story "The Pupil." A man is being considered for a position as a live-in tutor for a woman's child.

> The poor young man hesitated and procrastinated: it cost him such an effort to broach the subject of terms, to speak of money to a person who spoke only of feelings and, as it were, of the aristocracy. Yet he was unwilling to take leave, treating his engagement as settled, without some more conventional glance in that direction than he could find an opening for in the manner of the large affable lady who sat there drawing a pair of soiled [suede gloves] through a jewelled hand and, at once pressing and gliding, repeated over and over everything but the thing he would have liked to hear.

Which choice best states the main purpose of the text?

A) It describes a person's unsuccessful attempt to change someone's mind.

B) It portrays the difficulty a person has with raising a topic of conversation.

C) It criticizes a person for being excessively timid.

D) It draws a sharp contrast between the personalities of two people.

9

Chorioactis geaster, a species of mushroom that makes a distinctive hissing sound when it releases its spores, is an elusive fungus that has been observed only in Texas and Oklahoma in the US and in the Miyazaki and Nara Prefectures in Japan. Scientists aren't entirely sure why *C. geaster* is distributed in this way (genetic analysis reveals that the US and Japanese strains diverged 19 million years ago), but the mushroom appears to be very selective: it is typically found on the decaying stumps and roots of only a few tree species that are abundant in these areas.

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

A) It elaborates on a characterization of *C. geaster* presented earlier in the text.

B) It emphasizes the uncertainty about *C. geaster* alluded to earlier in the text.

C) It highlights the negative impact *C. geaster* has on the trees on which it's found.

D) It provides an explanation for the relationship between *C. geaster* and its habitats.

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CONTINUE

10

In their study of the steering muscles regulating sclerites (minute hardened structures) in the *Drosophila* (fruit fly) wing hinge, Johan M. Melis et al. used machine learning to devise a convolutional neural network (CNN) model capable of predicting the pattern of wing motion produced by the maximum activity of the muscles. The CNN model's output aligned with results of prior studies by other researchers measuring muscle activity patterns directly—one of several indications, said Melis et al., that the model accurately represents important biomechanical processes underlying wing motion.

Which choice best states the main purpose of the text?

A) To present evidence from Melis et al.'s study in support of the efficacy of their CNN model
B) To account for Melis et al.'s reliance in their study on a CNN model in lieu of direct measurement
C) To provide an overview of how Melis et al. honed the accuracy of their CNN model
D) To compare results obtained by Melis et al. using their CNN model to prior results obtained from other researchers' models

11

Under US president Franklin D. Roosevelt's New Deal, the Federal Theatre Project (FTP) was one of many government programs that provided jobs during the Depression. Besides employing thousands of people, the FTP also brought theater to audiences across the country. The FTP had theater companies located nationwide, and through touring, it was able to reach rural areas that hadn't been previously exposed to theater. With hundreds of productions of both new and classic plays, the FTP was the largest theater program ever run by the federal government.

According to the text, what did the Federal Theatre Project accomplish during the Depression?

A) It gave theater workers the opportunity to travel to see new performances in addition to gaining professional work experience.
B) It created jobs while also making theater accessible to audiences all over the country.
C) It lowered the cost of theater productions by moving performances from urban to rural areas.
D) It increased the quality of theater productions by giving the federal government creative oversight.

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CONTINUE

12

In a period of great prosperity during his reign, Egyptian pharaoh Amenemhat III (circa 1800 BCE) had a pyramid with a massive substructure built at Hawara. The underground complex was largely dismantled in antiquity, but accounts of its splendor remain, including one from Greek historian Herodotus, who claimed to have seen it. In his *Histories* (circa 425 BCE), Herodotus writes of 3,000 chambers adorned with carved figures, a dozen courts flanked by white stone pillars, and many winding passages in the complex, characterizing it as a great labyrinth and "an unending marvel."

According to the text, what information did Herodotus include in his *Histories*?

A) A record of how long it took for the pyramid and complex to be constructed at Hawara

B) An account of the magnificence of the complex that once stood beneath the pyramid at Hawara

C) A discussion of how building the pyramid and complex at Hawara led to a period of prosperity

D) An explanation of how Herodotus was able to arrange to see the pyramid and complex at Hawara

13

India's Chandrayaan space program focuses on exploring the Moon. The missions include three vehicles: a lander, a rover, and an orbiter. Chandrayaan-2 was launched in 2019. Although the Chandrayaan-2 orbiter remained in flight around the Moon, the lander and rover crashed. Despite the crash, the Chandrayaan-2 mission has provided some important information.

Which statement, if true, would most directly support the text's characterization of the mission's outcome?

A) One of the main goals of the Chandrayaan-2 mission was to set a lander on the Moon's surface.

B) During the 2023 mission, known as Chandrayaan-3, the rover and lander managed to safely reach the Moon's surface.

C) The Chandrayaan-2 rover had six wheels and weighed approximately 20 kilograms (44 pounds).

D) The Chandrayaan-2 orbiter continues to orbit the Moon, and its instruments have identified possible signs of water.

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CONTINUE

14

Projected Annual Costs and Profits of Biofuel Profit Models (in dollars)

Method	LCFS revenue	Total revenue	Total cost	Total profit
Heuristic	6,837,474	37,957,674	30,528,134	7,429,540
Lexicographic	9,878,474	40,998,474	30,528,134	10,470,340
Proposed	11,157,472	42,277,472	30,933,469	11,344,003

Biofuels typically emit less carbon than do fossil fuels. In California, biofuel manufacturers have two revenue sources: biofuel sales and LCFS (low carbon fuel standard) credits purchased from them by companies producing fuel that falls short of California's emission standards. Given the interplay between these revenue streams, Meltem Denizel et al. examined three models for how a biofuel firm might maximize profit: the industry-standard heuristic model, a lexicographic model, and a model proposed by the researchers. They concluded that although their model maximized profit, it might not be ideal for firms that need to minimize cash outflows.

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

A) The proposed model shows the highest total revenue, LCFS revenue, and total cost of all three models.

B) Both the total revenue and total profit for the lexicographic model are higher than those for the heuristic model but lower than those for the proposed model.

C) While the proposed model projects the highest total profit, it also projects a higher total cost than the lexicographic model, which projects the same total cost as the heuristic model but a higher total profit.

D) While the total profit and the LCFS revenue are nearly the same for the proposed model, the total profit is significantly greater than the LCFS revenue for the lexicographic model.

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CONTINUE

15

Autofiction is an emerging literary form that incorporates autobiographical writing into fiction. Practitioners of autofiction emphasize the autobiographical aspects of their work by patterning their protagonists' lives after their own, typically naming their protagonists after themselves. Autofiction usually borrows formal elements from autobiographical writing too, including its first person point of view and its use of a narrative voice so forthright that it borders on confessional. Ocean Vuong's 2019 novel *On Earth We're Briefly Gorgeous* is a representative work of autofiction, one that erases the distinction that fiction typically observes between authors and the characters they create.

Which statement, if true, would most strongly support the text's description of *On Earth We're Briefly Gorgeous*?

A) *On Earth We're Briefly Gorgeous* makes use of imagery in much the same way that contemporary poetry does, exploiting certain images—butterflies, for example—for their emotional or conceptual associations; in this way, Vuong blurs the distinction between poetry and fiction.

B) Although the narrative of *On Earth We're Briefly Gorgeous* proceeds in a largely chronological fashion, as narratives do in most works of fiction, the form of Vuong's narrative is unique: the novel consists of a single long letter that the protagonist, a soft-spoken young man, has written to his mother.

C) The novel's protagonist bears an obvious resemblance to Vuong himself, and in interviews Vuong speaks of the protagonist as a sort of alter ego, yet the protagonist refers to himself as "Little Dog" throughout the novel and never divulges his actual name.

D) The novel portrays the upbringing of the protagonist, a young writer, in a working-class Vietnamese American family that is virtually identical to Vuong's family, and the protagonist narrates the novel in a tone that many reviewers describe as surprisingly frank.

16

Carolina chickadees are cavity nesting birds that initiate nest building at the same time of year as golden paper wasps, a species that also nests in enclosed spaces. Researchers observed that both species will settle in nesting boxes, but birds and wasps are not often observed co-occupying boxes, leading to the hypothesis that the two species compete for nesting sites. To test this hypothesis, the researchers installed nesting boxes throughout a nature preserve in the US state of North Carolina, manipulated some of the boxes to exclude birds, and then monitored the boxes for two years. Not only was the hypothesis validated, there was also a clear indication of competitive advantage for birds.

Which finding from the study, if true, would most directly support the text's characterization of the study's results?

A) Even though overall usage of the nesting boxes by wasps and birds was high throughout the study, 24% of the manipulated boxes remained vacant each spring, while less than 4% of the unmanipulated nesting boxes remained vacant.

B) Nest initiation by either birds or wasps but not both was observed in more than 90% of the unmanipulated boxes, but nest initiation by wasps was observed in less than 50% of the manipulated boxes.

C) Although only 15 instances of co-occupation of unmanipulated boxes by wasps and birds were observed over the course of the study, in a majority of those instances, wasps were already occupying the boxes when birds initiated nesting in them.

D) Wasps initiated nesting in manipulated boxes much more often than in unmanipulated boxes, and 80% of initial co-occupations of unmanipulated boxes resulted in abandonment by wasps but not by birds.

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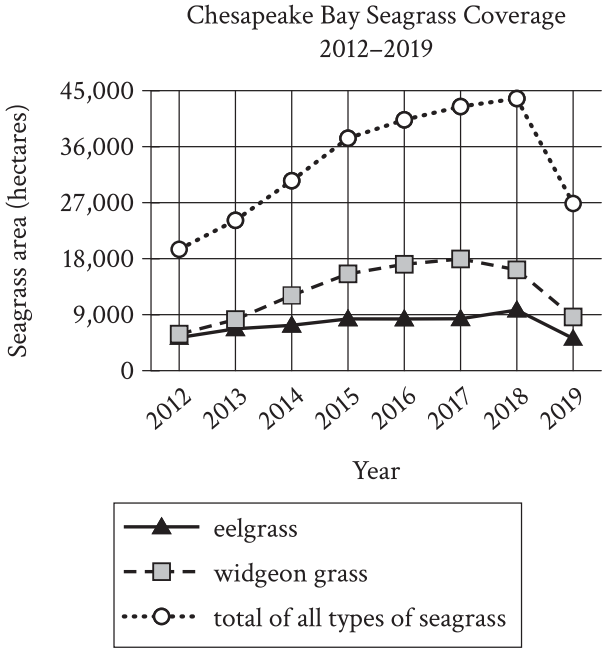
CONTINUE

17



Chesapeake Bay seagrass meadows constitute crucial habitats for many aquatic species. Historically, eelgrass has been predominant, but widgeon grass is proving better suited to recent increases in sea temperature, tolerating heat better and growing faster than eelgrass does. Although the increase in widgeon grass has been associated with a substantial increase in total seagrass coverage in the bay, researchers caution that the latter change does not necessarily make the seagrass ecosystem as a whole more resilient to environmental shocks.

Which statement, if true, would account for data shown in the graph and would illustrate the point made by the researchers?

A) Between 2012 and 2017, the total area covered by widgeon grass and the total area covered by all types of seagrass increased as water temperatures in the bay increased.

B) Water temperatures in the bay increased slowly from 2012 to 2018, but in early 2019 there was an unprecedentedly large increase in temperatures, which reached levels that can be tolerated by few seagrass species other than widgeon grass.

C) In early 2018, a fungal infection that affects widgeon grass and eelgrass but does not affect other types of seagrass spread through the bay.

D) In early 2019, unusually heavy rains washed excessive nutrients into the bay, leading to algal blooms that prevented sunlight from reaching many seagrass species.

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CONTINUE

18

Time-based media artworks feature video, slides, audio, or computer technologies. To experience a time-based media artwork, viewers watch or listen to the piece as it plays over a period of time, usually in a museum setting. When designing such works, artists carefully select which equipment and materials to use to display them. But artists' choices can create a challenge for museums. Works may make use of technologies that become outdated, such as slide projectors and old television monitors. Such technologies can be difficult to maintain and replacements aren't always available. If these technologies break, therefore, _____

Which choice most logically completes the text?

A) replacing the works with newer works that use more up-to-date technologies may be too expensive for many museum budgets.

B) museum policies about how to dispose of the works may need to be updated.

C) continuing to exhibit the works may require adapting artists' original visions for how their works are displayed.

D) modern viewers may experience the works over longer periods of time than the works' first viewers did.

19

Carcinization, or the evolution of a crablike body form, has taken place in crustaceans many times over the last 250 million years. Decarcinization has occurred several times as well, even though it involves the loss of traits such as sideways walking that seem to have helped carcinized groups persist in a variety of ecosystems. In a 2021 paper, Joanna Wolfe and team note that many decarcinized groups are extinct and have very few living relatives—signs that decarcinization might be an "evolutionary dead-end." But the team also discusses frog crabs, a living decarcinized group with traits suited to dwelling in sediment; fossils show that the group had decarcinized members as far back as the Early Cretaceous. This example suggests that _____

Which choice most logically completes the text?

A) despite having many living relatives, some decarcinized groups did not benefit from decarcinization.

B) a crablike body form may not be optimal in all cases, with ecological conditions sometimes favoring the persistence of decarcinization.

C) sideways walking may have been less important to the survival of frog crabs than a protected abdomen and other traits associated with carcinization.

D) the evolutionary benefits of a crablike body form are less certain than many studies of carcinization had previously implied.

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CONTINUE

20

During the Second World War, codebreakers working for the US military deciphered encrypted messages. Many of _____ codebreakers were women.

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

A) that
B) this
C) these
D) it

21

The atomic structure of an element _____ the element's place on the periodic table.

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

A) determining
B) to determine
C) having determined
D) determines

22

You can see Brazilian artist Tarsila do Amaral's bold use of color in her painting *Sol Poente* (*Setting Sun*). Created in 1929, the painting _____ bright green cacti towering in front of a candy-orange sky.

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

A) featuring
B) feature
C) features
D) to feature

23

In addition to being a celebrated writer, musician, and educator, Zitkála-Šá (Yankton Dakota) was the cofounder of the National Council of American _____ advocated for Native American civil rights throughout the 1920s and 1930s.

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

A) Indians, which
B) Indians
C) Indians,
D) Indians. Which

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CONTINUE

24

Assembling _____ by hand and in painstaking detail, Nigerian American artist Njideka Akunyili Crosby works at a methodical pace when completing her massive collage-based paintings.

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

A) her
B) that
C) them
D) it

25

The Eiger, the Mönch, the Jungfrau—Alpine summits like these were little more than wastelands to many Europeans until the eighteenth century, when attitudes toward such intimidating landscapes shifted as part of a broader aesthetic _____ by Irish philosopher Edmund Burke, this shift framed mountains as sublime objects capable of producing delightful terror.

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

A) revolution initiated
B) revolution that, initiated
C) revolution. Initiated
D) revolution, initiated

26

The unconventional literary philosophy with which Fernando Pessoa approached his writing is manifested in the Portuguese poet's "heteronyms," his term for the dozens of fictional personas in whose voices he authored many of his _____ among these personas was Ricardo Reis, author of classical odes in a Horatian style.

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

A) works and
B) works: and
C) works;
D) works,

27

A groundbreaking visual artist of her day, _____ including artists Vasily Kandinsky and Piet Mondrian.

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

A) the explorations of Hilma af Klint into abstract modes of painting occurred well before those of many of her contemporaries,
B) well before many of her contemporaries, Hilma af Klint explored abstract modes of painting,
C) Hilma af Klint explored abstract modes of painting well before many of her contemporaries,
D) Hilma af Klint, well before many of her contemporaries, explored abstract modes of painting,

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CONTINUE

28

In a theater-in-the-round, the stage is surrounded on all sides by the audience. This means that the play must remain visible from all angles. _____ plays performed in-the-round often use minimal sets and scenery, so the view of the actors is not blocked.

Which choice completes the text with the most logical transition?

A) For this reason,
B) By contrast,
C) Instead,
D) Next,

29

Analyses of Rembrandt's seventeenth-century painting *The Night Watch*, citing its richly saturated colors and stark contrasts between light and shadow, often characterize the work as an exemplar of the Baroque-era style. Many art historians, however, challenge the very notion of a distinct Baroque era. They claim that the so-called Baroque aesthetic was, _____ just an extension of the stylings of the Renaissance era.

Which choice completes the text with the most logical transition?

A) first of all,
B) similarly,
C) in reality,
D) nevertheless,

30

The lack of accessible written sources is a common challenge faced by biographers of pre-nineteenth-century subjects. _____ when writing his biography of Alexander Hamilton (1755–1804), historian Ron Chernow had at his disposal Harold Syrett's 26-volume, 19,000-document *Papers of Alexander Hamilton*.

Which choice completes the text with the most logical transition?

A) To take one well-known example,
B) It thus came as no surprise that,
C) In accordance with this premise,
D) On the other end of the spectrum,

31

Plastic bag proponents point out that, while most curbside recycling programs can't process the bags, consumers have the option to bring their plastic bags to specialty recycling facilities. That the number of consumers who go to such efforts remains paltry suggests that practical concerns counter the bags' theoretical recyclability. _____ the notion that plastic bags are recyclable appears at present to be little more than wishful thinking on their proponents' part.

Which choice completes the text with the most logical transition?

A) In response,
B) In other words,
C) At the same time,
D) However,

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CONTINUE

32

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

- The Schomburg Center for Research in Black Culture is a research library in New York City.
- It was named for Arturo Alfonso Schomburg.
- It was founded in 1925.

The student wants to indicate the year the Schomburg Center was founded. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) The Schomburg Center was named for Arturo Alfonso Schomburg.
B) The Schomburg Center was founded in 1925.
C) The Schomburg Center is a research library.
D) The Schomburg Center is located in New York City.

33

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

- Stop motion animation (SMA) is a filmmaking technique that involves manipulating characters (puppets, clay figures, etc.) by hand in minute increments.
- Each change in position is meticulously captured in a series of images that, when played back, give the illusion of motion.
- Producer Travis Knight: "It's a process that dates back to the dawn of cinema, with a charm and a warmth and a beauty that other forms of animation...do not have. And because you effectively get one opportunity to get it right, every shot is a high-wire act."
- Knight: SMA is "raw and it's imperfect. It's also undeniably human."

The student wants to emphasize the aesthetic qualities of SMA by quoting Knight. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) With its puppets and clay figures, stop motion animation, Knight says, "dates back to the dawn of cinema."
B) The handmade, "imperfect" look of stop motion animation, says Knight, lends this "undeniably human" technique a "charm and a warmth and a beauty."
C) As Knight says, "you effectively get one opportunity to get it right" when meticulously capturing the series of images that, when played back, give it the illusion of motion.
D) Stop motion animation is imperfect, making every shot "a high-wire act," Knight says.

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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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

Examining samples from coral reefs in the Pacific Ocean, a team of microbiologists was able to _____ as many as 3 million different species of bacteria. The team classified the bacteria by looking at differences in their DNA. These results suggest that there are more bacteria species than scientists previously thought.

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

A) repair
B) build
C) command
D) identify

2

Cognitive science research has found that people tend to be biased against art when they think it was generated by artificial intelligence (AI) software. One hypothesis for the preference for human-created art is that people _____ the effort behind a piece of art: the more work they believe went into a piece's creation, the more likely they are to appreciate it.

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

A) prevent
B) neglect
C) perform
D) value

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CONTINUE

3

Some paleontologists thought that a sudden shift toward an arid climate on the Australian continent may have brought about the rapid extinction of several species of large kangaroos around 200,000 years ago. However, new evidence that the change in conditions occurred well before those species went extinct is forcing paleontologists to _____ that hypothesis.

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

A) recollect
B) introduce
C) revise
D) interpret

4

Broods of periodical cicadas (inch-long winged insects) emerge for six weeks in late spring on a cycle of either 13 or 17 years. In 2024, the emergences of the Great Southern Brood (on a 13-year cycle) and the Northern Illinois Brood (on a 17-year cycle) coincided in the Midwest and Southeast United States, _____ that happens only once every 221 years. Sixteen states were covered with a trillion cicadas.

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

A) a convergence
B) a division
C) a succession
D) an expiration

5

Ancient Greek and Roman sculpture is sometimes characterized as idealizing human subjects, but in fact there are many Greco-Roman sculptures that depict people in decidedly _____ ways.

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

A) implausible
B) unflattering
C) superficial
D) imprecise

6

The following text is adapted from Eugene O'Neill's 1920 play *Beyond the Horizon*. Andrew and Robert Mayo are brothers who grew up on their family's farm.

> ANDREW: Farming ain't your nature. There's all the difference shown in just the way us two feel about the farm. You—well, you like the home part of it, I expect; but as a place to work and grow things, you hate it. Ain't that right?
>
> ROBERT: Yes, I suppose it is. For you it's different. You're a Mayo through and through. You're wedded to the soil. You're as much a product of it as an ear of corn is, or a tree. Father is the same. This farm is his life-work.

Which choice best states the main purpose of the text?

A) It shows how two characters solved a mystery.
B) It describes a place two characters visited on vacation.
C) It emphasizes a difference between two characters.
D) It illustrates that two characters share a goal.

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CONTINUE

7

The University of South Carolina library has a copy of F. Scott Fitzgerald's novel *The Great Gatsby* with notes in the margins made by poet and author Sylvia Plath. Plath marked favorite passages and wrote down some of her thoughts. Next to the novel's description of one character's feelings, Plath wrote the French phrase "L'Ennui" (which refers to weariness and boredom). Plath later wrote a poem titled "Ennui" that may have been inspired by that part of *The Great Gatsby*.

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

A) It explains why Plath decided to become a poet.
B) It names a poem that Plath wrote long before she read *The Great Gatsby*.
C) It indicates that Plath thought Fitzgerald's writing was very exciting.
D) It gives an example of one of Plath's notes in the margins of *The Great Gatsby*.

8

Text 1
In the past, music albums were created to be played back on physical formats like records. A typical record holds only about twenty-five minutes of music on each of its shiny black sides. This forced artists and producers to think carefully about what music to include on an album and what to leave out. Today's artists don't have to worry as much about fitting their music on physical formats. For this reason, many of today's artists are making albums that are much longer than albums from decades past.

Text 2
In today's digital age, most music is created to be streamed from online services. These services remove the limitations of physical formats like records and CDs. This may be why many new albums are longer and have more songs than albums crafted for physical formats. Unfortunately, many of these longer albums suffer from a lack of focus.

Based on the texts, the author of Text 1 and the author of Text 2 would most likely agree with which statement about many new albums?

A) Many new albums are longer than albums generally once were.
B) Many new albums are quieter than albums generally once were.
C) Many new albums include more artwork than albums generally once included.
D) Many new albums sell more copies than albums generally once sold.

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CONTINUE

9

Guojun He and colleagues studied a food-delivery phone app that is popular in China. The researchers found that having "no cutlery" automatically selected influences whether customers request disposable plastic utensils with their food orders. Based on their results, the researchers concluded that this and other small changes to the app could reduce plastic waste in China by as much as 3.26 million metric tons per year.

According to the text, which choice best describes a conclusion He and colleagues drew from their study?

A) Food-delivery apps that prevent customers from requesting cutlery are becoming more popular.
B) Customers who understand how food-delivery apps work make more environmentally friendly choices.
C) Small changes to how a food-delivery app works can greatly lower plastic waste.
D) Production of plastic waste in China is likely to increase in the near future.

10

The soil on Mars can make missions to explore the planet challenging, as the sand and dust are known to clog filters and lock moving parts on robotic rovers and other exploration devices. Using simulants, which are materials designed to simulate different planetary surfaces, scientists are able to study the characteristics of Mars's surface. Simulants like the Mars Mojave simulant—which was developed using lava deposits from California's Mojave Desert—help scientists evaluate how well their devices will handle the surface when operated on Mars.

Based on the text, what is one reason why simulants are valuable for scientists?

A) Simulants allow scientists to test the ability of research equipment to withstand some of the conditions it will encounter during a mission.
B) Simulants can be mixed with soil from Earth to explore how research equipment will handle extreme terrains on Earth.
C) Scientists use simulants to track how the chemical properties of planetary soils have changed over time.
D) Scientists use simulants to compare the physical properties of Mars's surface to those of Earth's surface.

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CONTINUE

11

The following text is from Narcíso Tondreau's 1898 poem "Yesterday and To-Day" (translated by Agnes Blake Poor in 1918). The poem is about an old statue of the Greek goddess Venus, which now lies on the ground in a state of disrepair.

> How long ago, by summer breezes fanned,
> Here stood the newborn Venus, fresh and fair;
> All palpitating from the master's hand,
> The last touch of his chisel lingering there.
>
> "And surely this shall last!" he proudly thought;
> "Fixed in immortal marble is my fame!"
> Just here, where human hand has surely wrought,
> Some crumbling letters may have spelled his name.

In the text, what does the speaker say that the artist believed about his sculpture?

A) It would be carefully repaired when it inevitably begins to deteriorate.
B) Its beauty would be recognized as surpassing that of other images of Venus.
C) It would bring him enduring fame by withstanding time.
D) It would be praised for its intricate details that he carefully chiseled.

12

Lin-Manuel Miranda's 2015 hip-hop musical *Hamilton* depicts historical political figure Alexander Hamilton as a self-made man who, through sheer determination, transcends his humble origins to become a key participant in the founding of the United States. This depiction of Hamilton establishes him as a compelling and well-defined protagonist but obscures other facets of the historical person's views, namely his elitism and mistrust of the democratic politics of some of his contemporaries. In effect, the musical's portrayal of Hamilton fails to convey the ideological complexity that a more nuanced portrayal might have suggested.

The text most strongly suggests that particular aspects of Hamilton's political beliefs may have been omitted from the musical in part to achieve which effect?

A) To suggest why certain contributions by Hamilton to US history have been overlooked
B) To challenge the prevailing historical consensus about Hamilton
C) To encourage modern audiences to emulate Hamilton's politics
D) To create an unambiguous thematic presentation of Hamilton's life

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CONTINUE

13

When a company has a new product, it has to decide when to tell people about it. Companies usually announce a new product before it is released and available for purchase. Those announcements can increase consumer excitement, which can mean that more people will buy the product. But the effect fades quickly, so companies need to be careful in timing the announcement and the release of a new product.

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

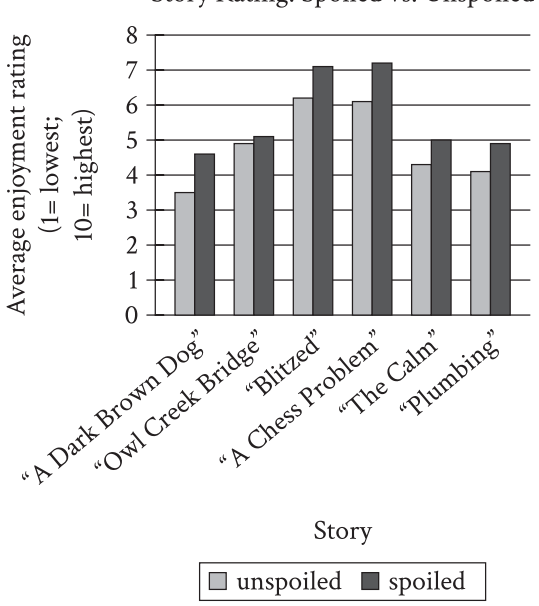
A) Consumers tend to prefer new products over older products.

B) The kind of information a company provides about a new product helps determine how likely consumers are to buy the product.

C) Consumers are more likely to buy a new product when they already use products from the company making the new product.

D) Consumer surveys show low excitement for new products that were announced a long time before they were released.

14



Researchers investigated how enjoyment of a story is affected when it has been spoiled (when the reader has foreknowledge of an important plot development). As part of the study, participants rated their enjoyment of one story that was spoiled before they read it and one story that was unspoiled. For each story, participants who had been given a spoiler reported greater enjoyment than did those who hadn't received a spoiler. But the degree of this difference varied across the stories, as is best illustrated by the enjoyment ratings for _____

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

A) "Blitzed" and "A Chess Problem."

B) "The Calm" and "Plumbing."

C) "Owl Creek Bridge" and "A Chess Problem."

D) "Blitzed" and "Plumbing."

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CONTINUE

15

Observed Traits in a Population of Broadleaf Arrowhead, by Flowering Date

Trait	Day 5	Day 10	Day 15	Day 20
Total number of open male and female flowers per growth unit	25	65	110	45
Estimated reproductive success rate of male flowers	0.29	0.29	0.29	0.29
Proportion of male flowers	0.45	0.50	0.48	0.13

The mating environment hypothesis predicts that populations of flowering plants compensate for reduced mating opportunities due to dichogamy (a plant's expression of male and female functions at separate times to prevent self-pollination) by adjusting the bias of floral sex allocation during the flowering period, increasing the probability of successful cross-plant pollination. Researchers tested the hypothesis by examining a population of broadleaf arrowhead, a plant for which bloom onset generally takes longer for male flowers than for female flowers, during the flowering season. They concluded that the mating environment hypothesis is not well supported by their observational data.

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

A) Sex allocations were largely evenly distributed on days 10 and 15 but were female biased on days 5 and 20.

B) Despite the sharp reduction in the total number of open flowers per growth unit from day 15 to 20, there was no decline in the estimated reproductive success rate of male flowers in that interval.

C) Although sex allocations became overwhelmingly female biased by day 20, male flowers' estimated reproductive success rate did not vary from day 5 to 20.

D) Whereas the total number of open flowers per growth unit peaked on day 15, the proportion of male flowers experienced a peak earlier in the flowering season, on day 10.

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CONTINUE

16

Filtration is a widely used method for removing microplastics—plastics with a width less than 5 millimeters (mm)—from waterways. However, filtration systems are typically unable to capture very small microplastics. Menake Piyasena and Nelum Perera designed a device that applies sound waves to water as it flows through a metal tube. The sound waves cause microplastics in the water to gather in the middle and along the sides of the tube. The microplastics can then be separated out by channeling polluted and clean water through different outlets. Testing indicated that the system removes even tiny microplastics, including ones as small as 10 microns, or 0.01 mm, wide. This result suggests that _____

Which choice most logically completes the text?

A) unlike sound waves, filters have the ability to remove large microplastics from polluted waterways.

B) directing water through filtration tubes with multiple outlets reduces microplastic pollution.

C) the sound wave treatment system may help solve a problem associated with filtration of microplastics.

D) combining filtration with sound waves is likely the most efficient method for removing microplastics from water.

17

Lichens lack root systems, so they must absorb water directly from the air, dew, and even tree bark and retain it in their bodies. A team of scientists recently used computer simulations to evaluate the importance of water stored in tree bark (bark water) for lichens in the Mediterranean region. In the control simulation, lichens had access to all water sources; in the experimental simulation, lichens had access to all sources except bark water. Compared to the control, the experimental simulation predicted a decrease in the lichens' overall biomass production of 21%. The experimental simulation (but not the control simulation) also predicted a decrease in the survival of certain species of lichen during the summer due to evaporative water loss, suggesting that _____

Which choice most logically completes the text?

A) although lichens can absorb water from multiple sources, most of the water they absorb is bark water.

B) only some specialized lichen species are able to absorb bark water during long periods of high evaporation.

C) bark water absorption reduces biomass production in lichens but makes them more resistant to seasonal changes in conditions.

D) access to bark water may help offset the effects of seasonal water loss for some lichen species.

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CONTINUE

18

A painted Chinese mural from 118 CE shows a person pushing a one-wheeled cart. Historians _____ that this is the earliest known depiction of a wheelbarrow.

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

A) to have believed
B) to believe
C) believing
D) believe

19

The first modern public zoo opened at the height of the French Revolution in 1793. Located in downtown Paris, the zoo was called the Menagerie du Jardin des Plantes. It was filled with living animals that had been confiscated _____ the private collections of French aristocrats.

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

A) from,
B) from:
C) from
D) from;

20

In the 1920s and 1930s, the singer Frank "Machito" Grillo performed with Cuba's most popular dance orchestras. However, the fusion of Latin music and American jazz that Machito innovated while performing in New York City is what has _____

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

A) his enduring fame earned him?
B) earned him his enduring fame.
C) his enduring fame earned him.
D) earned him his enduring fame?

21

Mountain goats were made to climb. In addition to having hard hooves that can dig into nearly any groove or _____ mountain goats have slender bodies ideal for scaling nearly ninety-degree cliffs.

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

A) crack
B) crack or
C) crack,
D) crack, or

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CONTINUE

22

A voluntary workforce established to make improvements to public lands, parks, and forests across the US, the Civilian Conservation Corps (CCC)—though widely popular—was not without its critics. For Aldo Leopold, the CCC was implicated in what _____ "Idle CCC camps," he wrote, "presented a widespread temptation to build new and often needless roads."

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

A) did he view as unnecessary development.
B) did he view as unnecessary development?
C) he viewed as unnecessary development.
D) he viewed as unnecessary development?

23

Creek Council Tree (1967) and *Cimarron Iron Bridge* (1972) are two oil landscape paintings by renowned Pawnee Nation artist Brummett Echohawk. In 2023, _____ displayed alongside other works by Echohawk at the student-curated exhibition *Brummett Echohawk: An Artist's Journey* at the Oklahoma State University Museum of Art.

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

A) they were
B) this was
C) it was
D) some were

24

Creating personas—brief profiles of imaginary characters that represent key segments of a customer base—can help user experience (UX) designers think like and empathize with those using their products. Fictional yet realistic, _____

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

A) these personas include specific details (demographics, browsing habits, etc.) that UX designers draw from actual users.
B) UX designers include specific details (demographics, browsing habits, etc.) drawn from actual users in these personas.
C) actual users are the source of the specific details (demographics, browsing habits, etc.) that UX designers include in these personas.
D) specific details that UX designers draw from actual users (demographics, browsing habits, etc.) are included in these personas.

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CONTINUE

25

The 2020 documentary *Without a Whisper—Konnon:Kwe* was directed by Katsitsionni Fox. It explores how Indigenous Haudenosaunee culture shaped the woman suffrage movement in the early nineteenth _____ how the personal and political authority Haudenosaunee women had in their communities influenced the first suffragists in the US.

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

A) century revealing
B) century, revealing
C) century. Revealing
D) century; revealing

26

In 1941, activists sought to persuade President Franklin Roosevelt to ban racial segregation in the military. _____ civil rights leader A. Philip Randolph planned a large anti-segregation march on Washington for July 1. Responding to the pressure, the president agreed to the ban, and the march was called off.

Which choice completes the text with the most logical transition?

A) In some cases,
B) To that end,
C) Apart from that,
D) By comparison,

27

Echinoderms are benthic organisms, which means that they live in the benthic zone at or near the bottom of lakes. _____ echinoderms are classified as macrobenthic organisms, "macro" referring to their relatively large size in comparison to meiobenthic and microbenthic organisms.

Which choice completes the text with the most logical transition?

A) As a result,
B) In other words,
C) To be exact,
D) By contrast,

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CONTINUE

28

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

- Chroma keying is a visual effects technique that layers different images or videos.
- It is used to produce a desired background in video footage.
- First, two videos are filmed: one with a desired background and another with a subject in front of a blue or green background.
- Then, video editing software is used to merge the videos, replacing the blue or green background with the desired background.
- Blue and green backgrounds are preferred because they contrast strongly with most subjects, which helps the software distinguish the subject from the background.

The student wants to describe the process of chroma keying. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) One reason blue and green backgrounds are preferred for chroma keying is because they contrast strongly with most subjects, which helps the software distinguish the subject from the background.

B) Chroma keying involves filming two videos, then using video editing software to replace the blue or green background of one video with the desired background of the other.

C) Chroma keying is a visual effects technique often used to replace the background in a video.

D) By using the technique known as chroma keying, one can replace the background in a video.

29

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

- In the 1800s, some actors also managed theaters.
- They were known as actor-managers.
- William Charles Macready managed the Covent Garden Theatre (London) from 1837 to 1839.
- He starred in a production of *Henry V* there in 1838.
- Laura Keene managed Laura Keene's Theatre (New York) from 1856 to 1863.
- She starred in a production of *The Seven Sisters* there in 1860.

The student wants to emphasize a similarity between Macready and Keene. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) Both Macready and Keene were managers of the Covent Garden Theatre in London, where they also starred in various plays.

B) In the 1800s, some actors (such as Keene) also managed theaters; they were thus considered actor-managers.

C) Macready managed a London theater, whereas Keene managed one in New York.

D) As actor-managers, both Macready and Keene managed theaters where they also performed.

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CONTINUE

30

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

- Australian ecologist Alison Lullfitz studied the distribution of *Platysace deflexa* (youlk), a small shrub with edible tubers.
- Lullfitz found that youlk plants gathered at sites across southwest Australia had very similar DNA despite differences in soil conditions.
- Lullfitz hypothesized that humans had transported the plant throughout the region.
- Lullfitz consulted Shandell Cummings and Lynette Knapp, members of the area's Noongar Aboriginal group.
- Cummings and Knapp confirmed that their ancestors carried youlk when traveling across the region.

The student wants to explain Cummings and Knapp's contribution to Lullfitz's study. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) Lullfitz consulted Cummings and Knapp, members of the Noongar Aboriginal group, who assisted with her study of *Platysace deflexa*, a small shrub with edible tubers.

B) Cummings and Knapp confirmed that DNA sequences from the *Platysace deflexa* plants Lullfitz had gathered were in fact very similar.

C) By indicating that their ancestors transported *Platysace deflexa*, Cummings and Knapp provided information that supported Lullfitz's hypothesis.

D) Lullfitz found that Cummings and Knapp had information relevant to her study of *Platysace deflexa*'s distribution.

31

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

- 1905: US astronomer Percival Lowell begins searching beyond Neptune for a mysterious planet he calls "Planet X."
- 1916: Lowell dies but leaves money to upgrade his observatory.
- 1929: A new telescope is built at the observatory.
- February 1930: Observatory assistant Clyde Tombaugh records the first photographic evidence of Planet X.
- March 1930: Astronomers rename Planet X, calling it Pluto to honor Lowell (the first two letters are Lowell's initials, PL).

The student wants to specify Percival Lowell's contributions to the discovery of Pluto. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) In 1930, Lowell became the first person to record photographic evidence of Pluto, known at the time as Planet X.

B) Lowell began the search for Pluto in 1905 and later left money to upgrade the observatory where it was discovered in 1930.

C) After a new telescope was built at Lowell's observatory in 1929, Clyde Tombaugh recorded the first photographic evidence of Planet X, later renamed Pluto.

D) Astronomers renamed Planet X in 1930 to honor Lowell for his contributions to the discovery of Pluto.

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CONTINUE

32

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

- Linguistic typologists classify and compare languages according to their structural features.
- One such structure is word order, or the way subjects (S), verbs (V), and objects (O) are typically arranged in a sentence.
- English employs an SVO word order (e.g., Cows eat grass).
- Bengali employs an SOV word order (e.g., Cows grass eat).
- Filipino employs a VSO word order (e.g., Eat cows grass).
- 87% of the world's languages are classified as either SVO or SOV.

The student wants to make a generalization about how word order is employed across languages. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) The way in which subjects, verbs, and objects are typically arranged in a sentence is also called word order.
B) Word order is one of the structural features by which linguistic typologists classify and compare the world's languages.
C) Linguistic typologists analyze and compare how word order is employed across languages.
D) The majority of languages place the subject of a sentence before the verb and object.

33

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

- Carbon can exist in several distinct structural forms called allotropes.
- Graphite is a carbon allotrope.
- Graphite is composed of stacked graphene sheets.
- Each graphene sheet is composed of carbon atoms arranged in a flat honeycomb pattern.
- Carbon nanotubes are carbon allotropes.
- They are composed of one or more graphene sheets wrapped into a cylindrical shape.

The student wants to emphasize a difference between carbon nanotubes and graphite. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) Unlike carbon nanotubes, which are composed of sheets of carbon atoms arranged in a flat honeycomb pattern, graphite is a cylindrical carbon allotrope.
B) Composed of sheets wrapped into a cylindrical shape, carbon nanotubes contrast with graphite, a carbon allotrope composed of graphene sheets.
C) Graphite and carbon nanotubes are allotropes composed of stacked or wrapped graphene sheets, but carbon can exist in several distinct structural forms.
D) The graphene sheets in graphite are stacked, whereas in carbon nanotubes, they form a cylinder.

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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Math

27 QUESTIONS

DIRECTIONS

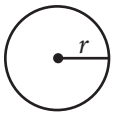
The questions in this section address a number of important math skills.
Use of a calculator is permitted for all questions.

NOTES

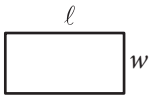
Unless otherwise indicated:

- 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.

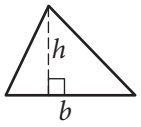
REFERENCE



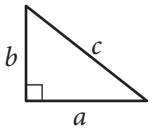
$A = \pi r^2$
$C = 2\pi r$



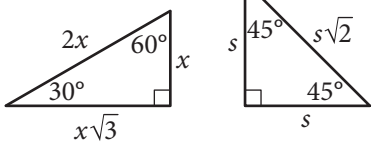
$A = \ell w$



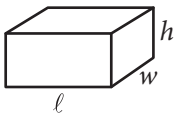
$A = \frac{1}{2}bh$



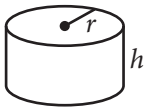
$c^2 = a^2 + b^2$



Special Right Triangles

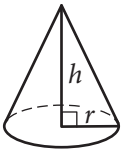


$V = \ell wh$

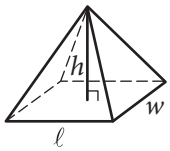


$V = \pi r^2 h$

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



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



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

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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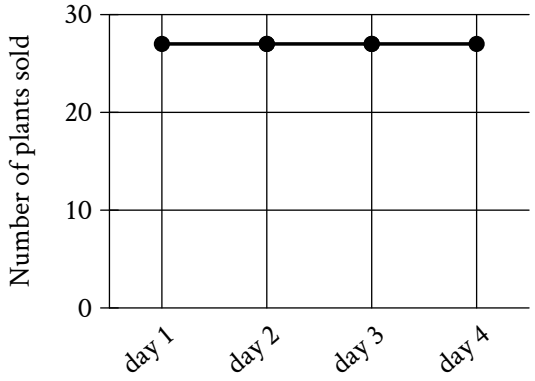
CONTINUE

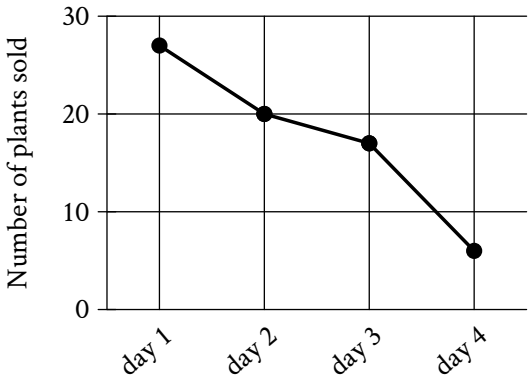
1

The owner of a plant store recorded the number of plants sold each day during a four-day period in the spring. If the number of plants sold increased each day, which of the following line graphs could represent the number of plants sold during this four-day period?

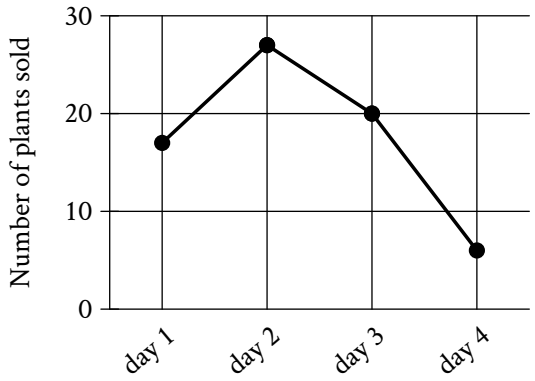
A)



B)



C)



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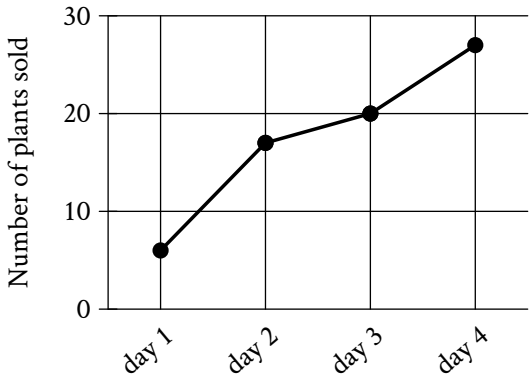

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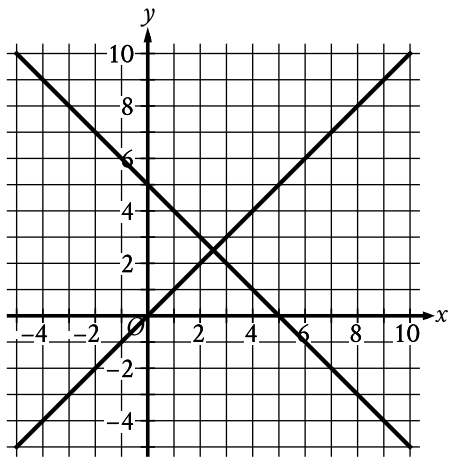
2

The solution to a system of linear equations is (5, 5). Which of the following could be the graph of the equations in the system?

A)



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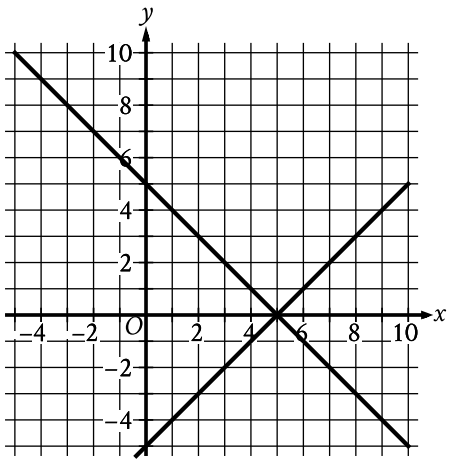

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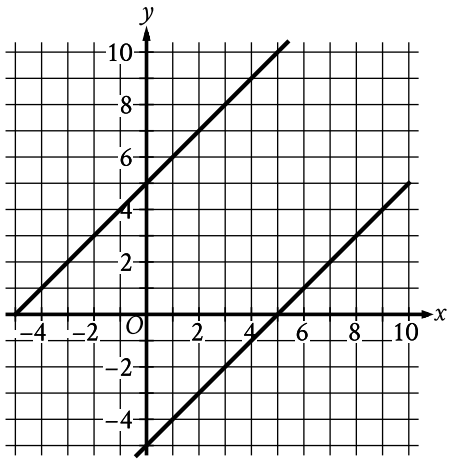
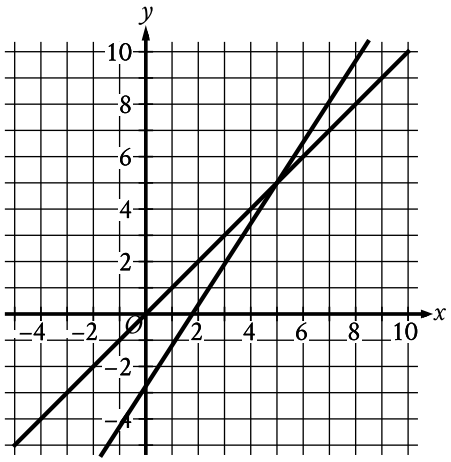


D)



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CONTINUE

3

During a race, a bicyclist's speed was 37 feet per second. What is this speed in feet per **minute**?

A) 67
B) 97
C) 1,110
D) 2,220

4

$$y = 4x - 13$$

$$y = ax - 13$$

In the given system of equations, a is a constant. The system has infinitely many solutions. What is the value of a?

A) 4
B) -9
C) -13
D) -17

5

$$y - 38 = mx$$

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

A) $y = mx + 38$
B) $y = 38x + m$
C) $y = 38m + x$
D) $y = 38mx$

6

Mara has read 120 pages of a 160-page research paper. On average, she reads 1 page every minute. At this rate, how much time, in minutes, will she spend reading the remaining pages of the research paper?

7

The table shown summarizes the distribution of 58 homes based on the number of years since they were designed by a certain architecture firm.

Number of years	Number of homes
0 to 5	8
6 to 10	4
11 to 15	14
16 to 20	5
21 to 25	6
26 to 30	12
31 to 35	9

How many of the 58 homes were designed by the architecture firm 21 or more years ago?

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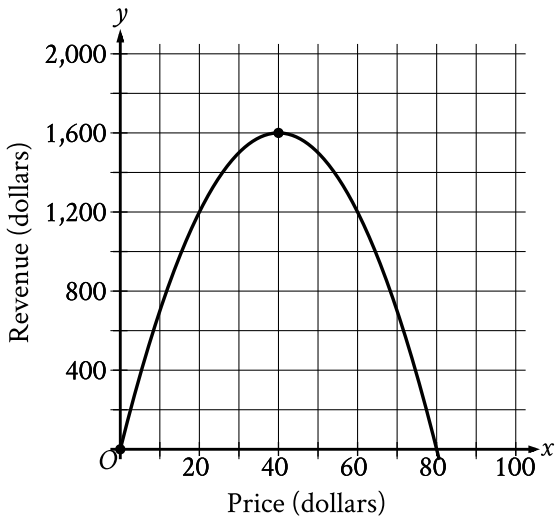
CONTINUE

8



The graph gives the estimated revenue, in dollars, for a company when the price of the company's product is x dollars. What does the y-value of the vertex of the graph represent in this context?

A) The price, in dollars, of the company's product

B) The minimum estimated revenue, in dollars

C) The maximum estimated revenue, in dollars

D) The estimated revenue, in dollars, when the price of the company's product is 0 dollars

9

A remote-controlled machine is designed to collect stone and sand samples. During an experiment, the machine moves at a constant velocity on a straight path toward a designated location. The equation $y = 500 - 148x$ gives the machine's distance from the designated location y, in meters, x hours after the start of the experiment. What is the best interpretation of 500 in this context?

A) The number of hours it takes the machine to reach the designated location

B) The machine's velocity, in meters per hour, during the experiment

C) The machine's distance, in meters, from the designated location at the start of the experiment

D) The total distance, in meters, the machine travels in 1 hour

10

$$6x + 6y = 50$$

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

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

A) -14

B) -7

C) 7

D) 14

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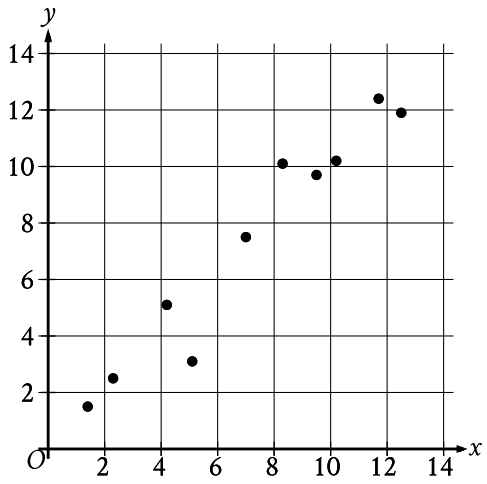
11

The scatterplot shows the relationship between two variables, x and y.



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

A) $y = -2x$
B) $y = -x$
C) $y = x$
D) $y = 2x$

12

$$g(x) = (14 - 2x)(8 + 2x)$$

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

A) 1.5
B) 3
C) 5.5
D) 11

13

The function f is defined by $f(x) = \frac{12}{11 - x}$. What is the value of $f(x)$ when $x = 5$?

14

The y-intercept of the graph of $5x + 3y = -27$ in the xy-plane is $(0, y)$. What is the value of y?

15

The product of a positive number x and the number that is 1 less than x is equal to 72. What is the value of x?

A) 0.5
B) 9
C) 71
D) 73

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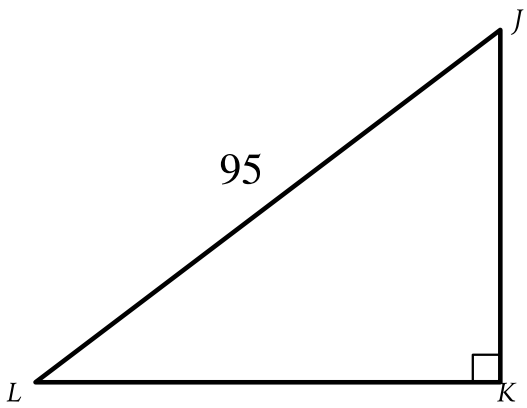
CONTINUE

16

The expression $1.28n$ represents the result of increasing the positive quantity n by p%. What is the value of p?

A) 0.72
B) 2.8
C) 28
D) 72

17



Note: Figure not drawn to scale.

In right triangle JKL, the tangent of $\angle L$ is $\frac{3}{4}$. What is the length of $\overline{JK}$?

A) $\frac{35}{16}$
B) $\frac{15}{4}$
C) 57
D) 76

18

A rack displays sweatshirts for two sports teams. The table shows the number of sweatshirts on the rack, classified by size and sports team.

	Tigers	Badgers	Total
Small	6	9	15
Medium	24	33	57
Large	18	24	42
Total	48	66	114

One sweatshirt from the rack will be selected at random. What is the probability of selecting a sweatshirt that is medium, given that the sweatshirt is a Tigers sweatshirt?

A) 0.21
B) 0.24
C) 0.42
D) 0.50

19

For the linear function p, $p(c) = -2$, where c is a constant, $p(5) = 22$, and the slope of the graph of $y = p(x)$ in the xy-plane is 4. For the linear function t, $t(c) = -5$ and $t(6) = 44$. What is the slope of the graph of $y = t(x)$ in the xy-plane?

A) -1
B) 2
C) 4
D) 7

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CONTINUE

20

The perimeter of a square can be expressed as $4(85)$ units. What is the length, in units, of a side of this square?

21

$$5x - 6y = x^2$$

$$5x - 6y = 16$$

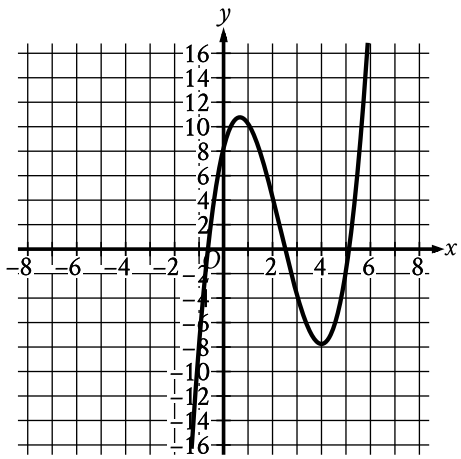
A solution to the given system of equations is (x, y), where x is positive. What is the value of x?

22

The exponential function f is defined by $f(x) = ab^x$, where a and b are positive constants. If $f(n) = p$ and the value of $f(n + 1)$ is 83.00% less than the value of p, where n and p are constants, what is the value of b?

A) 0.17
B) 0.83
C) 1.17
D) 1.83

23



The graph of $y = f(x) - k$ is shown in the xy-plane. If k, a, and b are positive constants, which equation could define f?

A) $f(x) = (x - a)^2(x + b)$
B) $f(x) = (x + a)^2(x - b)$
C) $f(x) = (x - a)^2(x + b)^2$
D) $f(x) = (x + a)^2(x - b)^2$

24

$$\sqrt{(x + 13)^2} = x + 13$$

What is the least value of x that is a solution to the given equation?

A) -14
B) -13
C) 0
D) 13

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CONTINUE

25

$$\frac{36x + 55}{11} = \frac{k}{22}x + n$$

In the given equation, k and n are constants. The equation has infinitely many solutions. What is the value of kn?

A) 180
B) 360
C) 1,980
D) 3,960

26

In triangle ABC and triangle DEF, sides AB and DE each have a side length of 6 inches, and angles A and D each have an angle measure of 65°. Which of the following additional pieces of information is(are) sufficient to prove whether triangle ABC is congruent to triangle DEF?

I. The measures of angles B and C are equal.
II. The lengths of sides AC and DF are equal.
III. The lengths of sides BC and EF are equal.

A) I is sufficient, but II and III are not.
B) II is sufficient, but I and III are not.
C) III is sufficient, but I and II are not.
D) II is sufficient and III is sufficient, but I is not.

27

$$32x + 84y = 360$$

The given equation represents the volume of compost x, in cubic feet, and the volume of soil y, in cubic feet, in a mixture of compost and soil that weighs 360 pounds. If the volume of soil in the mixture is 2 cubic feet, what is the volume of compost in the mixture, in cubic feet?

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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Math

27 QUESTIONS

DIRECTIONS

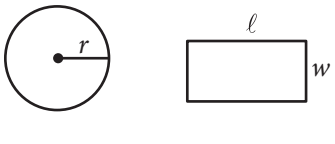
The questions in this section address a number of important math skills.
Use of a calculator is permitted for all questions.

NOTES

Unless otherwise indicated:

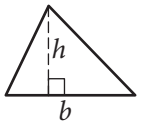
- All variables and expressions represent real numbers.
- Figures provided are drawn to scale.
- All figures lie in a plane.
- The domain of a given function f is the set of all real numbers x for which $f(x)$ is a real number.

REFERENCE

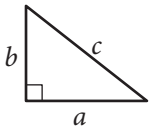


$A = \pi r^2$
$C = 2\pi r$

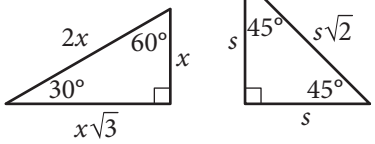
$A = \ell w$



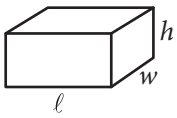
$A = \frac{1}{2}bh$



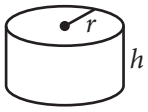
$c^2 = a^2 + b^2$



Special Right Triangles

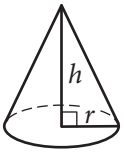


$V = \ell wh$

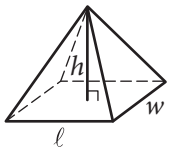


$V = \pi r^2 h$

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



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



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

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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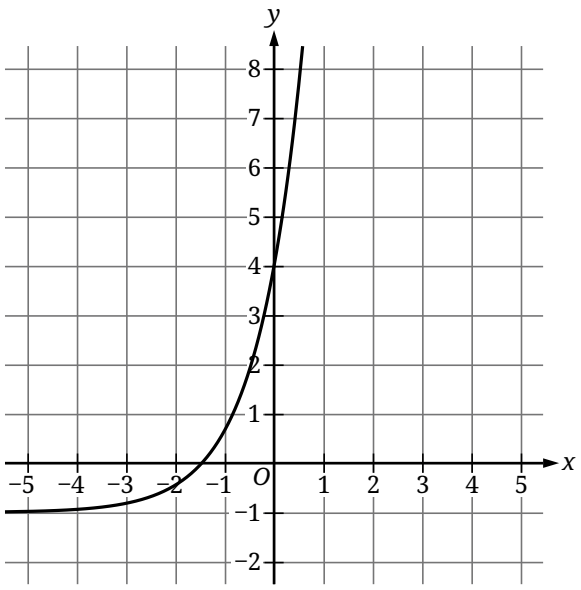
CONTINUE

1

Which of the following graphs has a y-intercept of $(0, 5)$?

A)



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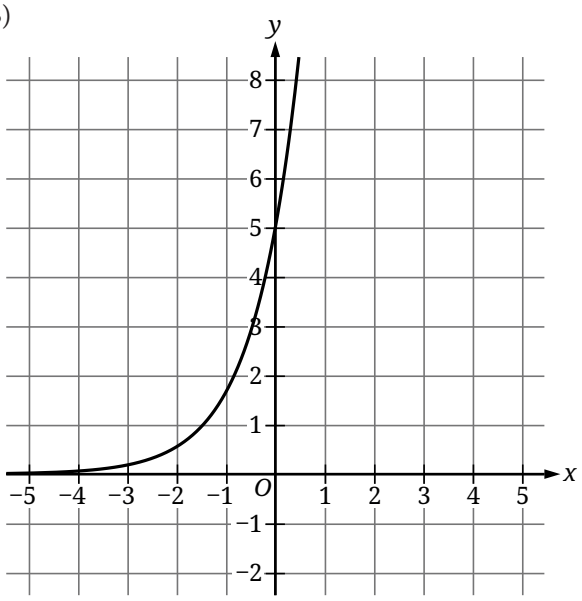
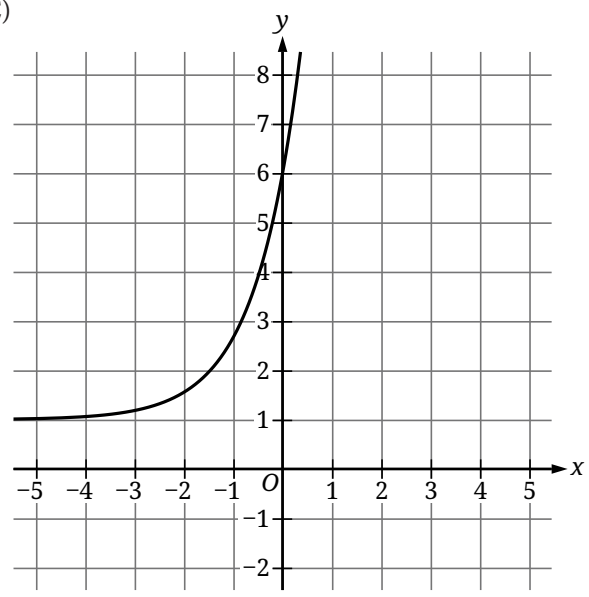
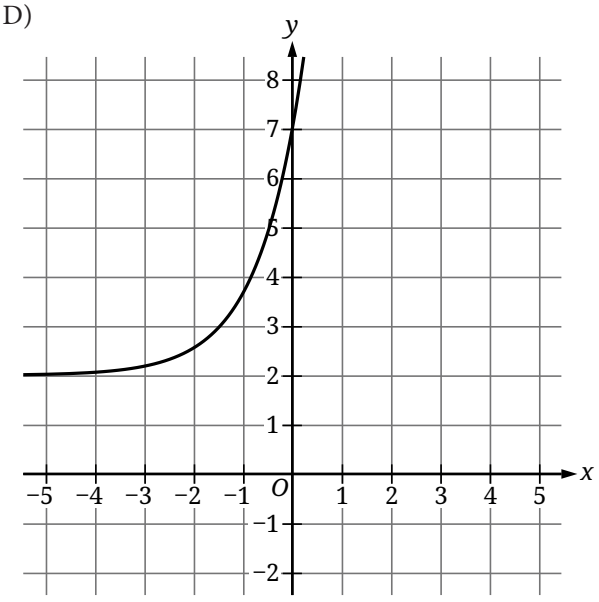


C)



D)



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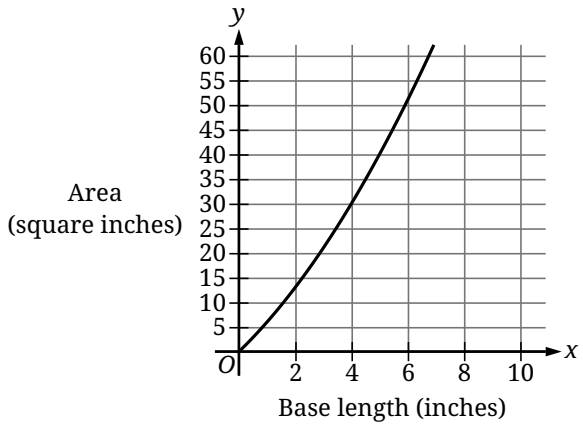
2



Karl cuts triangular pieces of plywood to be used in a wall art project. The graph gives the area y, in square inches, for each piece of plywood, where x is the base length, in inches, of the piece of plywood and $x > 0$. According to the graph, what is the best estimate of the area, in square inches, of one of Karl's triangular pieces of plywood with a base length of 4 inches?

A) 4
B) 8
C) 16
D) 30

3

An object's average acceleration, in meters per second squared, is the change in the object's speed, in meters per second, divided by the time during which the change occurred, in seconds. A car's speed changes by 58 meters per second in 8 seconds. What is the car's average acceleration, in meters per second squared, during this time period?

A) 0.14
B) 7.25
C) 50
D) 66

4

The length of each side of triangle A is 280 millimeters. The length of each side of triangle B is double the length of each side of triangle A. What is the length, in millimeters, of each side of triangle B?

A) 280
B) 282
C) 560
D) 1,120

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CONTINUE

5

The relationship between the variables x and y is defined by an exponential equation. When $x = 0$, the value of y is 60, and for every increase in the value of x by 1, the corresponding value of y increases by 10% of its previous value. Which equation represents this relationship?

A) $y = 60(1.10)^x$

B) $y = 60(1.01)^x$

C) $y = 10(1.60)^x$

D) $y = 10(1.06)^x$

6

A certain recreational speedboat can travel at a maximum speed of 20 meters per second. At this maximum speed, how many meters would this boat travel in 4 seconds?

7

What is 10% of 640?

8

Which expression is equivalent to $4xy(2x^2 + 6y)$?

A) $6x^3y + 10xy^2$

B) $8x^2y + 6y$

C) $8x^2y + 24xy$

D) $8x^3y + 24xy^2$

9

In one week, Sophia earned a total of $1,007 by working at her full-time job and at a part-time job. The equation $23h + 10c = 1{,}007$ represents this situation, where h is the number of hours worked at her full-time job and c is the number of hours worked at her part-time job. Which of the following is the best interpretation of 23 in this context?

A) The amount, in dollars, Sophia earned for each hour she worked at her full-time job

B) The amount, in dollars, Sophia earned for each hour she worked at her part-time job

C) The number of hours Sophia worked in one week at her full-time job

D) The number of hours Sophia worked in one week at her part-time job

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CONTINUE

10

The function f is defined by $f(x) = \frac{5}{11}x$. What is the slope of the graph of $y = f(x)$ in the xy-plane?

A) 0

B) $\frac{5}{11}$

C) $\frac{11}{5}$

D) The slope is undefined.

11

A food manufacturer advertises that bags of cereal produced by the manufacturer weigh, on average, 1 pound each. To test this, Jordan selected at random 35 bags of cereal produced by the manufacturer and weighed each bag. Based on his measurements, Jordan estimated that for all bags of cereal produced by the manufacturer, the average weight per bag is 1.03 pounds, with a margin of error of 0.05 pounds. For all bags of cereal produced by the manufacturer, which of the following is the most appropriate conclusion about the average weight w, in pounds, per bag?

A) $w = 1.03$

B) $0.98 \leq w \leq 1.03$

C) $0.98 \leq w \leq 1.08$

D) $1.03 \leq w \leq 1.08$

12

A cylinder has a diameter of 12 inches and a height of 21 inches. What is the volume, in cubic inches, of the cylinder?

A) 36π

B) 252π

C) 756π

D) $3{,}024\pi$

13

A rectangle has a length of 20 inches and a width of 1 inch. What is the area, in square inches, of the rectangle?

14

The function f is defined by $f(x) = 9x + 21$. What is the value of $f(x)$ when $x = 1$?

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CONTINUE

15

Luca plants 205 seedlings per hour. On Monday, he planted seedlings for 1 hour. On Tuesday, he planted seedlings for t hours. Which function s gives the total number of seedlings Luca planted on Monday and Tuesday?

A) $s(t) = 205t$

B) $s(t) = 205t + 205t$

C) $s(t) = 205 + 205(t + 1)$

D) $s(t) = 205(t + 1)$

16

For 5 years, an arborist measured the growth rates of two trees that were growing near each other: a silver maple tree and a red maple tree. Each year, the silver maple tree's height increase was 2.3 feet. Each year, the red maple tree's height increase was 32% less than the silver maple tree's height increase in the same year. Which of the following types of functions best models how the height of the red maple tree changed over time during these 5 years?

A) Decreasing exponential

B) Increasing exponential

C) Decreasing linear

D) Increasing linear

17

If $\frac{x - 19}{24} = \frac{x - 19}{8}$, what is the value of $x + 19$?

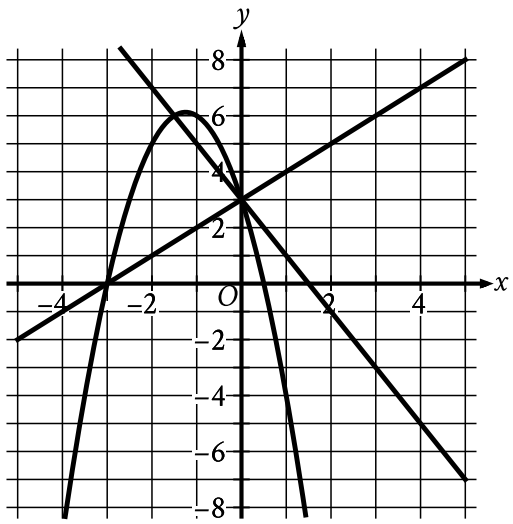
A) 0

B) 3

C) 19

D) 38

18



The graph of a system of three equations is shown. The system consists of two linear equations and one quadratic equation. How many solutions does this system have?

A) 1

B) 2

C) 3

D) 4

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CONTINUE

19

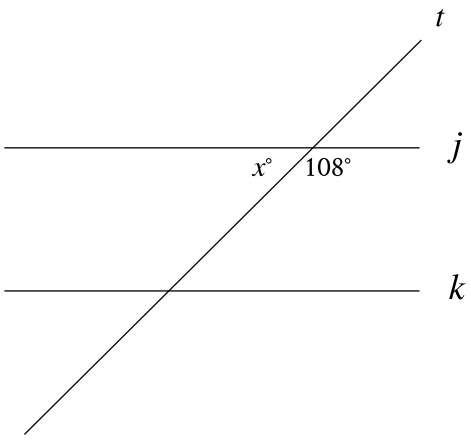
$$y < 48 - 8x$$

$$\frac{y}{8} > 10$$

Which inequality represents the x values for all solutions (x, y) that satisfy the given system of inequalities in the xy-plane?

A) $x > 6$
B) $x < 6$
C) $x > -4$
D) $x < -4$

20



Note: Figure not drawn to scale.

In the figure, line j is parallel to line k. What is the value of x?

21

The expression $4x^3 + 32$ is equivalent to $k(x^3 + 8)$, where k is a constant. What is the value of k?

22

$$3x^2 - 3x - 1 = 0$$

What are all possible solutions to the given equation?

A) $x = \frac{1}{2} \pm \frac{\sqrt{3}}{6}$

B) $x = -\frac{1}{2} \pm \frac{\sqrt{3}}{6}$

C) $x = \frac{1}{2} \pm \frac{\sqrt{21}}{6}$

D) $x = -\frac{1}{2} \pm \frac{\sqrt{21}}{6}$

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CONTINUE

23

When several resistors are connected in series in a circuit, the total resistance of the circuit is the sum of the resistances of these resistors. A certain circuit consists of 7 resistors connected in series, where the resistance of each resistor is positive. This circuit has a total resistance of 110 ohms. The total resistance of 3 resistors in this circuit is 90 ohms. Which inequality best represents all possible values of the resistance x, in ohms, of one of the other 4 resistors in this circuit?

A) $0 < x < 5$

B) $0 < x < 20$

C) $20 < x < 90$

D) $20 < x < 110$

24

A scientist combines two different concentrations of an oxygen-nitrogen gas mixture at a constant temperature to fill a tank to a total pressure of 80 atmospheres (atm), of which 36% is contributed by oxygen. Gas mixture A contributes x atm of pressure to the tank, of which 27% is contributed by oxygen. Gas mixture B contributes y atm of pressure to the tank, of which 45% is contributed by oxygen. Which system of equations represents this situation?

A) $x + y = 80$
$0.45x + 0.27y = 0.36(80)$

B) $x + y = 80$
$0.27x + 0.45y = 0.36(80)$

C) $x + y = 0.36(80)$
$0.45x + 0.27y = 80$

D) $x + y = 0.36(80)$
$0.27x + 0.45y = 80$

25

In the xy-plane, line k and line ℓ are perpendicular and intersect at the point $(2, 8)$. If line k is defined by the equation $y = mx + b$, where m and b are constants and $m > 1$, which of the following points lies on line ℓ?

A) $\left(3, 8 - \frac{1}{m}\right)$

B) $\left(3, 8 + \frac{1}{m}\right)$

C) $(3, 8 - m)$

D) $(3, 8 + m)$

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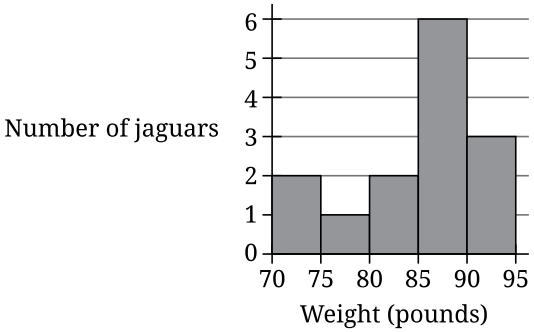
CONTINUE

26



The histogram summarizes a data set of the weights, in pounds, of 14 young female jaguars. If an additional weight of 32 pounds is added to the original data set to create a new data set of 15 weights, which of the following measures must be less for the new data set than for the original data set?

I. The median

II. The mean

A) I only
B) II only
C) I and II
D) Neither I nor II

27

$(x - 245)(x + 246) = 0$

What is a solution to the given equation?

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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GENERAL DIRECTIONS

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

TIMING

Reading and Writing, Module 1: 39 minutes

Reading and Writing, Module 2: 39 minutes

10-minute break

Math, Module 1: 43 minutes

Math, Module 2: 43 minutes

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

MARKING YOUR ANSWERS

- Be sure to answer your questions properly in this book.
- Circle only one answer to each question. If you change your mind, completely erase the circle. You will not get credit for questions with more than one answer circled, or for questions with no answers circled.

USING YOUR TEST BOOK

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

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