

# Reading and Writing Module 1

## 27 QUESTIONS

1

The Apollo Moon landings (1969-1972) brought radiation detectors and equipment too heavy for lift off to the Moon and produced large amounts of data. Researcher Philip Metzger who is investigating the long-term effects of being on the Moon, continues to use Apollo's data, demonstrating that the missions' value to science is \_\_\_\_.

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

- A) ongoing
- B) original
- C) displaced
- D) controversial

2

The following text is from Amy Tan's 1989 novel *The Joy Luck Club*. The narrator describes practicing the piano when she was a child.

For the talent show, I was to play a piece called "pleading Child" from Schumann's *Scenes from childhood*. It was a simple, moody piece that sounded more difficult than it was. I was supposed to memorize the whole thing, playing the repeat parts twice to make the piece sound longer. But I dawdled over it, playing a few bars and then cheating, looking up to see what notes followed. I never really listened to what I was playing. I daydreamed about being somewhere else, about being someone else.

Based on the text, when the narrator describes herself as "cheating," what does she most likely mean?

- A) she was violating an expectation about how to perform the piece.
- B) she was gaining an unfair advantage over other contestants in the talent show.
- C) she was deceiving her piano teacher.
- D) she was lying to herself about her musical ability.

3

The Historical Dictionary of Science Fiction is a crowdsourced project started in 2001 by lexicographer Jesse Sheidlower to record terms that originated in science fiction. Volunteers share digitized excerpts from personal collections of sci-fi magazines not typically preserved in libraries --- \_\_\_\_ that allow the earliest uses of phrases such as "warp speed" (1952) to be identified and added to the dictionary.

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

- A) contributions
- B) resolutions
- C) negotiations
- D) justifications

4

Today's theater stages are frequently filled with props and scenery to immerse the audience in a play's world. Because theatergoers have grown used to carefully designed sets, plays with few visual elements can surprise audiences. But simple, unadorned stages were likely \_\_\_\_ audiences in the very distant past: highly decorated and detailed sets were not common until the 1600s.

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

- A) expected by
- B) confusing to
- C) exciting to
- D) disliked by

5

Having trouble getting rid of weeds? One surprising solution may be to start eating them. Curly dock and broadleaf plantain are two edible plants that are usually considered weeds in North America. These and other plants like them are sometimes more flavorful than are some plants that people grow as food.

Which choice best states the main purpose of the text?

- A) To suggest an unexpected solution to a problem
- B) To discuss the best way to garden
- C) To describe how good some plants taste
- D) To identify a new cooking trend

6

Ceremony, the 1977 novel by Laguna Pueblo author Leslie Marmon Silko, is typical of Native fiction written during the 1960s and 1970s. During that period, Silko and her peers wrote realistic and deeply serious portrayals of life in tribal communities. Recently, however, younger Native writers have embraced popular genres known for being entertaining and suspenseful, such as fantasy and horror. Anishinaabe author Nathan Adler is a figure in this movement. Their 2016 novel Wrist is a work of horror fiction.

Which choice best describes the overall structure of the text?

- A) It discusses fiction by earlier Native writers, then describes how fiction by more recent Native writers differs from the earlier fiction.
- B) It praises one Native fiction writer, then criticizes a different Native fiction writer.
- C) It provides an overview of Native fiction, then compares it to fiction by non-Native writers.
- D) It describes one Native author's early works, then describes her more recent works.

7

In 2013 Bridie J.M. Allan and colleagues published a study concluding that ocean acidification has a strong effect on the behavior of Pomacentrus amboinensis, a species of fish. However, Allan and colleagues' study relied on a mean sample size of only about 18 fish, in a 2022 review of various scientists' conclusions about the impacts of ocean acidification on fish behavior, Timothy D. Clark and colleagues caution that relying on such a relatively small sample size can increase the potential for biased analysis. such analysis, in turn, can contribute to reports of exaggerated effects.

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

- A) It presents a criticism of the results reported by Allan and colleagues in their 2013 study.
- B) It lists several traits of Pomacentrus amboinensis discovered by Allan and colleagues while conducting their 2013 study.
- C) It emphasizes a detail about where Allan and colleagues conducted their 2013 study.

D) It states the conclusion reached by Allan and colleagues in their 2013 study.

8

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) Scientists use simulants to track how the chemical properties of planetary soils have changed over time.
- C) Simulants can be mixed with soil from Earth to explore how research equipment will handle extreme terrains on Earth.
- D) Scientists use stimulants to compare the physical properties of Mars's surface to those of Earth's surface.

9

Millions of Metric Tons of Copper Mined in 1995 and 2020

Country	1995	2020
Indonesia	0.44	0.51
United States	1.85	1.20
Kazakhstan	0.26	0.55
Chile	2.49	5.73

While doing research for a paper about metal exports, a student finds information about copper mining in different countries in 1995 and 2020. The student notes that Chile produced 2.49 million metric tons of copper in 1995 and \_\_\_\_\_

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

- A) 5.73 million metric tons of copper in 2020.
- B) 0.55 million metric tons of copper in 2020.

- C) 1.20 million metric tons of copper in 2020.  
D) 0.51 million metric tons of copper in 2020.

10

For years, Christopher Clavius's 1593 work *Astrolabium* had the earliest known evidence of a decimal point, which was in a sine table's interpolation column. However, math historian Glen Van Brummelen posited that Venetian merchant Giovanni Bianchini, who worked as an astrological consultant, used the mathematical symbol approximately 150 years before Clavius did. Van Brummelen asserts that in his role as a consultant, Bianchini used trigonometry to calculate the coordinates of the planets, and these calculations contain the earliest example of the decimal point.

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

- A) several dots appear in both Clavius's *Astrolabium* and Bianchini's *Flores Almagesti*, but the dot was commonly used in manuscripts in the 1400s and 1500s as a means to separate letters or whole numbers from each other.
- B) In Clavius's *Astrolabium*, he gives several examples of both interpolation and inverse interpolation using decimal numbers and justifies the method to his readers by equating 45.7 with "457 tenths."
- C) In a table in Bianchini's astronomical Latin manuscript from the 1440s, *Tabulae primni mobilis B*, a dot appears between two numbers in a context that suggests the value is not a whole number
- D) As recorded in his manuscripts, some of Bianchini's calculations for the coordinates of the planets are inaccurate due to the use of whole numbers rather than non-whole-number decimals.

11

Average Monetized Productivity Loss at  
Two Points After Programs Began, in  
Australian Dollars

Type of training	12 weeks	12 months
EET	268	171
EHP	282	436

Michelle Pereira et al, hypothesized that introducing health improvements into workplaces would increase productivity by reducing absenteeism (sick employees not working) and presenteeism (sick workers working less productively due to illness). Pereira's team enrolled groups of Australian workers in two programs: one that gave employees exercise training (EET) and one that enrolled employees in health promotion seminars (EHP). They then calculated the productivity loss of those groups at 12 weeks and 12 months after the programs began (based on the 28 days preceding each point). They concluded that exercise training was not effective at restraining productivity loss than health promotion seminars were, though this result took time to become apparent.

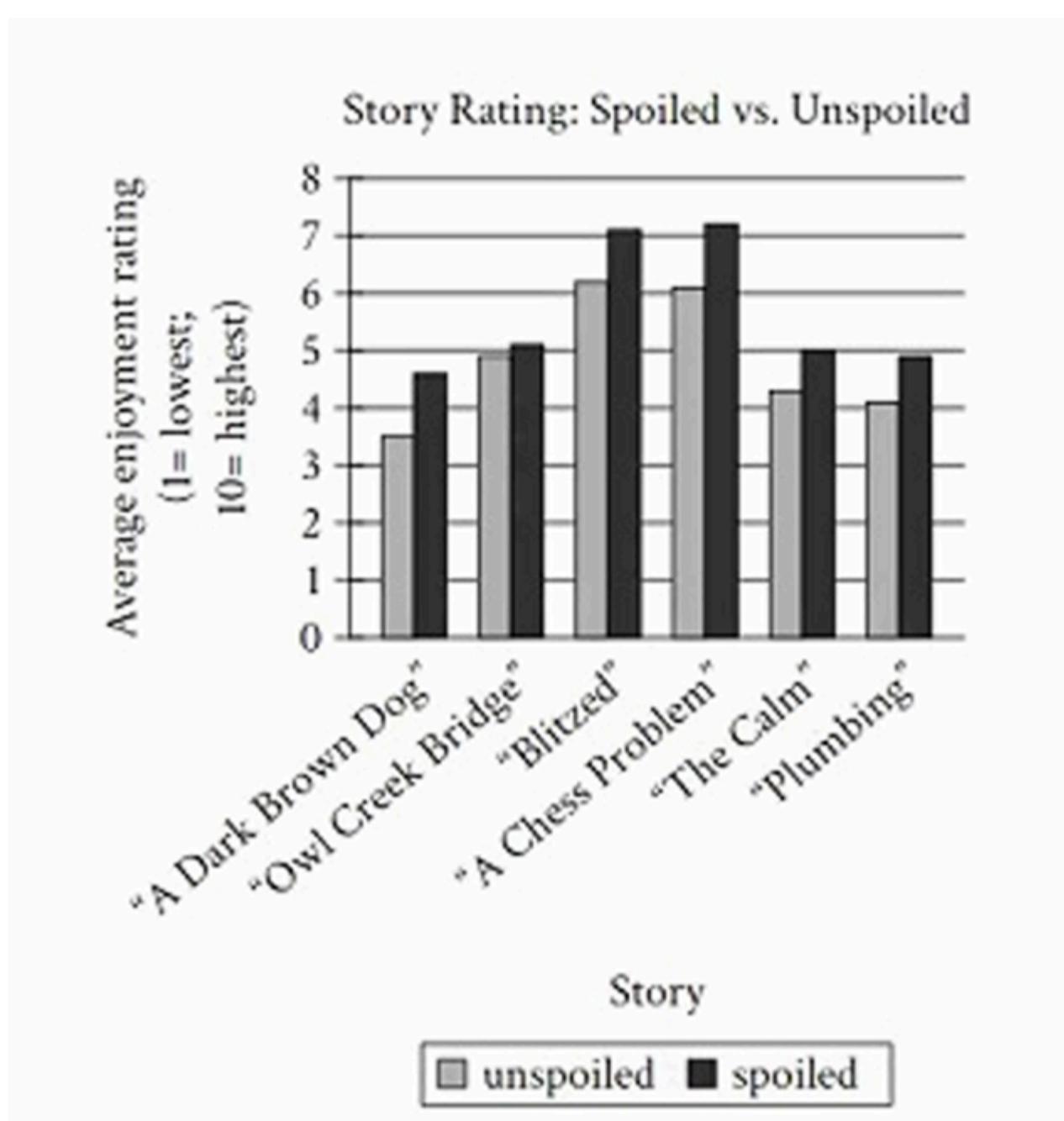
Which choice best describes data from the table that most effectively strengthen Pereira and colleagues' conclusion?

- A) Productivity loss was largely due to absenteeism for the EHP group at 12 months after the program began, while productivity loss was largely due to presenteeism for the EET group at 12 months after the program began.
- B) Productivity loss for the FET group barely decreased between 12 weeks and 12months after the program began, while productivity loss for the EHP group significantly increased during the same time period.

C) Productivity loss was consistently higher for the EHP group than for the EET group over the twelve months that it was measured, though the size of the difference between the two decreased over that time.

D) Productivity loss was fairly similar for the EET and EHP groups 12 weeks after each program began, but at 12 months afterward it had significantly increased for the EHP group and significantly decreased for the EET group.

12



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 "Plumbing".
- B) "Owl Creek Bridge" and "A chess Problem."
- C) "Blitzed" and "A Chess Problem."
- D) "The calm" and "plumbing."

13

Humans are overwhelmingly right-hand dominant (85-909b) and can thus be said to exhibit strong population level right handedness (PLRH). Among studies of nonhuman primates, Margaret F. Redshaw's 1993 study of captive gorillas purported to show PLRH, while Jane Goodall's 1963 study of wild chimpanzees did not. Overall, the studies claiming PLRH in nonhuman primates find much lower incidences of right-handedness than humans exhibit, but it's worth noting that studies of captive primates tend to show significantly greater incidences of right-handedness than studies of wild primates do, therefore raising the possibility that \_\_\_\_\_.

which choice most logically completes the text?

- A) the number of individuals in the study of wild chimpanzees is insufficient to preclude the claim that nonhuman primates exhibit PLRH.
- B) the number of individuals in the study of captive gorillas is insufficient for a robust claim regarding evidence of PLRH.
- C) the greater exposure to humans among the captive gorillas induced them to acquire more right-handed behaviors.
- D) the apparent discrepancy between the studies' results may be partly attributable to the 1963 study using different criteria when assessing hand dominance than were used in the 1993 study

14

The small white heron and the small dark heron are long-legged birds that live in wetlands, like the Everglades in Florida, Laura D'Acunto and colleagues wanted to know how these birds choose an area in which to live. They looked at features of the birds' habitats, such as the geographic location of the area and how deep the water is during breeding season. They found that although only small white herons prefer areas with deepwater during breeding season, both small white herons and small dark herons prefer areas that have standing water for more than 60 days per year. The researchers therefore concluded that neither species is very drawn to areas where \_\_\_\_\_

which choice most logically completes the text?

- A) there is standing water for far fewer than 60 days per year
- B) species with breeding seasons longer than 60 days are likely to be present.
- C) there are any features that attract the other species.
- D) there is relatively deep water during the breeding season.

15

It is hard for publishers and printers to create very long books that balance the requirements of readability, durability, and cost. Among some exceptionally long novels published in English, Haruki Murakami's 1Q84 (translated from Japanese) was published in a 1,157-page edition and runs to an estimated 407,000 words, while John Sayles's A Moment in the Sun (written originally in English) was published in a 1,100-page edition and runs to an estimated 625,000 words. This indicates that \_\_\_\_\_

which choice most logically completes the text?

- A) the edition of a Moment in the sun has more words per page than the edition of 1Q84.
- B) translating a text from Japanese to English is likely to increase the word count.
- C) page count is likely to be a more reliable indicator of how long it takes to read a book than word count.
- D) the edition of 1Q84 is printed on thinner paper than the edition of A Moment in the Sun.

16

Portrait of Marquess Massimiliano Stanpa is one of dozens of remaining works by the Italian Renaissance artist Sofonisba Anguissola. \_\_\_\_\_ in 1557, her painting can now be found at the Walters Art Museum in Baltimore.

which choice completes the text so that it conforms to the conventions of standard English?

- A) Will complete
- B) Completed
- C) Completes
- D) Was completed

17

Synthesized calcium phosphate nanoparticles (CaPNPs) can be used to improve the healing and regeneration of broken bones; this function, well suited for multiple medical applications, \_\_\_\_\_ from the biocompatible properties of these particles.

which choice completes the text so that it conforms to the conventions of standard English?

- A) stemming
- B) having stemmed
- C) stems
- D) to stem

18

The Austronesian language family comprises some 1,200 languages --- including the \_\_\_\_\_ Madurese and Bikol, which are spoken by 14 million and 4.6 million speakers, respectively --- and accounts for one-fifth of the world's languages, making it of keen interest to linguists like Diane Massam.

which choice completes the text so that it conforms to the conventions of standard English?

- A) languages
- B) languages---
- C) languages:
- D) languages,

19

For the past 20 million years, Earth's magnetic poles in the far north and far south have remained roughly where they are today. This has not always been the \_\_\_\_\_ throughout geologic history. Earth's magnetic poles have swapped places several times through a process called polar wandering.

which choice completes the text so that it conforms to the conventions of standard English?

- A) case; though,
- B) case, though,
- C) case, though;
- D) case, though

20

Russian-born visual artist Helga Stentzel turns household items into strange and surprising works of art. In her prints, tan sweatpants take on the form of a camel as they dangle from a \_\_\_\_\_ the red handles of a pair of pliers become the thongs of flip flops --- flip flops made of nails. This "household surrealism," Stentzel says, "Is about finding magic in the mundane."

which choice completes the text so that it conforms to the conventions of standard English?

- A) clothesline,
- B) clothesline;
- C) clothesline ---
- D) clothesline:

21

Nineteenth-century Modernista architects championed nature in their designs. Granted, the dramatic archways and botanical glasswork of Palau Mornau, a Modernista private home designed by Manuel Raspall, couldn't exactly grow in a forest. \_\_\_\_\_ one sees natural influences in Raspall's penchant for curves (rather than right angles) and plant --- and animal-inspired flourishes.

which choice completes the text with the most logical transition?

- A) Furthermore,
- B) Still,
- C) Similarly,
- D) In other words,

22

In Panama, citizens must be at least 18 years old to vote in their country's elections, \_\_\_\_\_ citizens in the Isle of Man need only be 16 years old to cast their vote.

which choice completes the text with the most logical transition?

- A) Firstly,
- B) By comparison,
- C) For example,
- D) Therefore,

23

Generally, sleek vehicles are more aerodynamic than bulkier ones. For example, the streamlined nose of the Airbus A320 jet helps it glide through wind with relative ease. \_\_\_\_\_ a boxy semitruck encounters more wind resistance, making it less aerodynamic.

which choice completes the text with the most logical transition?

- A) Specifically,
- B) On the other hand,
- C) As a result,
- D) In conclusion,

24

As a federalist, New York physician and writer Charles McKnight favored the US Constitution's provisions for a strong centralized government and supported the document's ratification; \_\_\_\_\_ essays he published in the New-York journal in December 1787 under the pseudonym "Examiner" disparaged the arguments of the anti-federalists, who opposed the constitution's adoption.

which choice completes the text with the most logical transition?

- A) in other words,
- B) fittingly,
- C) by comparison,
- D) nevertheless,

25

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

- Epazoyucan is a municipality in the state of Hidalgo, Mexico.
- Municipalities are governmental regions responsible for providing many public services to their residents.
- One service they provide is traffic control.
- Epazoyucan covers an area of roughly 140 km<sup>2</sup>
- Hidalgo is divided into 84 municipalities.

The student wants to emphasize the size of Epazoyucan. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- A) The municipality of Epazoyucan in Hidalgo, Mexico, covers an area of roughly 140 km<sup>2</sup>
- B) Epazoyucan --- a governmental region in the state of Hidalgo, Mexico --- provides many public services to its residents.
- C) Epazoyucan is one of 84 governmental regions, known as municipalities, across Hidalgo.
- D) Providing traffic control is just one example of the public services that municipalities provide.

26

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

- The United States has designated more than 500 areas National Wildlife Refuges (NWRs).
- Some NWRs were established specifically to protect endangered species.
- The Crocodile Lake NWR is a 6,686-acre area in Florida.
- It was established to protect the endangered American crocodile.
- The Pearl Harbor NWR is a 61-acre area in Hawaii.
- It was established to protect the endangered Hawaiian stilt.

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

- A) Both the Crocodile Lake NWR and the Pearl Harbor NWR were established to protect endangered species.
- B) Some NWRs, such as Hawaii's Pearl Harbor were established specifically to protect endangered species.
- C) While the Crocodile Lake NWR extends across a 6,686-acre area, the Pearl Harbor NWR encompasses only 61 acres.
- D) The US has designated more than 500 areas NWRs, including the Crocodile Lake NWR in Florida.

27

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

- Felipe Posada (pseudonym The Invisible Realm) is a New York city-based artist who specializes in the form of art known as surrealist collage.
- Manifestation of the unconscious mind is a central aspect of surrealist collage.
- Irrational juxtaposition of disparate elements is a central aspect of surrealist collage.
- Posada's *Synchronicity* irrationally juxtaposes images of a well-dressed man, a clouded mountain range, and a doorway to the stars.
- Posada: "My art is a journey through the invisible realm --- a space where intuition, memories, visions, and dreams are free to take visual form."

The student wants to provide a specific example of irrational juxtaposition in surrealist collage. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- A) Images of a well-dressed man, a clouded mountain range, and a doorway to the stars are juxtaposed irrationally in the surrealist collage piece *Synchronicity* by artist Felipe Posada.
- B) The irrational juxtaposition of disparate elements in Felipe Posada's art invokes "a space where intuition, memories, visions, and dreams are free to take visual form."
- C) *Synchronicity* by artist Felipe Posada is an example of surrealist collage, a form in which irrational juxtaposition is a central aspect.

D) Surrealist collage, such as Felipe Posada's *Synchronicity*, manifests the unconscious mind and irrationally juxtaposes disparate elements.

# Reading and Writing Module 2

## 27 QUESTIONS

1

As with other river deltas, the Kolyma River delta is \_\_\_\_: it is a constantly evolving network of channels and strips of land that change in size and shape as the river deposits new sedimentary particles where the river meets the waters of the East Siberian Sea.

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

- A) unrivaled
- B) dynamic
- C) sustainable
- D) immutable

2

Noting the correspondence of Leonardo da Vinci's *Mona Lisa* to his self-portrait in red chalk, artist Lillian Schwartz argued that the former is a self-portrait, too --- that by mapping his own features onto those of its ostensible subject, Lisa del Giocondo, Leonardo depicted himself as a woman. Indeed, by subjecting both works to digital analysis, Schwartz \_\_\_\_ the two faces' structural resemblance.

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

- A) corroborated
- B) amalgamated
- C) promulgated
- D) consolidated

3

While modern composers may often get inspiration from past greats like Ludwig van Beethoven, the extent of their influences is broad. The music of Ernesto Lecuona, for example, can be said to \_\_\_\_ elements of both the classical European tradition and the social, political, and cultural landscape of his native Cuba.

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

- A) defy
- B) neglect
- C) foretell
- D) exhibit

4

During the 2007-2010 financial crisis, the United States furnished billions of dollars to selected countries' central banks via mechanisms called swap lines. Aditi Sahasrabuddhe found that countries' policy environments seem to have been \_\_\_\_ swap-line decisions: the probability that banks would be granted swap lines was 0.20 in countries open to foreign-capital inflows and 0.03 in countries with policies restricting such inflows.

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

- A) predicated on
- B) mediated by
- C) decoupled from
- D) material to

5

Though John Crowley, author of *Four Freedoms*, is perhaps not as well known as the most widely read American writers of the past fifty years, influential figures have championed his work, including the poet James Merrill and the literary critic Harold Bloom. In his afterword to Crowley's book *Little, Big*, Bloom praises the novel's adroit blend of what playwright Friedrich Schiller termed the naive and sentimental modes --- while Schiller thought works could be classified as either naive (seeking to describe reality) or sentimental (seeking to develop ideas), *Little, Big* demonstrates that a work can be both.

which choice best states the main purpose of the text?

- A) To present a reason why a literary critic is impressed by a certain novel
- B) To explain what inspired an author to write a particular work
- C) To compare the work of a writer with the work of a poet who admired him
- D) To argue that all writing must be classified as belonging to one of two categories

6

The following text is adapted from George Eliot's 1857 short story "The Sad Fortunes of the Rev. Amos Barton." Mr. Ely is a clergyman in the town of Milby.

By the laity of Milby and its neighborhood [Mr. Ely] was regarded as a man of quite remarkable powers and learning, who must make a considerable sensation in London pulpits and drawing-rooms on his occasional visit to the metropolis; and by his brother clergy he was regarded as a discreet and agreeable fellow. Mr. Ely never got into a warm discussion; he suggested what might be thought, but rarely said what he thought himself, he never let either men or women see that he was laughing at them, and he never gave any one an opportunity of laughing at him.

which choice best describes the overall structure of the text?

- A) It implies that Mr. Ely's neighbors are more naive in their estimation of him than people in London are and then explains why his neighbors have been so easily misled.
- B) It presents the favorable opinion of Mr. Ely that other people hold and then describes the behaviors of Mr. Ely that enable him to maintain that favorable opinion.
- C) It shows that Mr. Ely had originally been held in high regard by his friends and then details the events that caused their regard for him to subside.
- D) It highlights the disparity between Mr. Ely's public and private behavior and then conveys why he labors to obscure his true self from other people.

7

Text 1 is adapted from E.M. Forster's 1910 novel *Howards End*. Text 2 discusses *Howards End*, King's Cross and St. Pancras are adjacent railway terminals in London from which trains travel to the countryside.

Text 1

To Margaret the station of King's Cross had always suggested infinity. Its very situation --- withdrawn a little behind the facile splendors of St. Pancras --- implied a comment on the materialism of life. Those two great arches, colorless, indifferent, shouldering between them an unlovely clock, were fit portals for some eternal

adventure, whose issue might be prosperous, but would certainly not be expressed in the ordinary language of prosperity.

## Text 2

The interplay between opposing ideological positions in *Howards End* is broadly articulated in the novel's organization of geographic space. On the one hand, the modern metropolis of London represents capitalism's emphasis on pragmatism and the accumulation of material wealth; on the other, the English countryside, accessible via King's Cross, fosters an idealism that values tradition, authentic personal connection, and the aesthetic --- what the novel calls "the infinite."

Based on the texts, the author of Text 2 would most likely agree with which statement about King's Cross, as it is depicted in Text 1?

- A) Because it is situated at the beginning of Margaret's journey from the city to the country, King's Cross emblematises the intrusion of the forces of materialism and modernity into the rural spaces that the novel associates with idealism and tradition.
- B) The austerity conveyed by King's Cross's appearance mirrors Margaret's disillusionment with the prospect of having authentic connections with other people in a world that chiefly values more conventional forms of prosperity.
- C) As a point of connection between London and the countryside, King's Cross suggests to Margaret the possibility of acquiring the intangible abundance promised by the kinds of authentic engagements that the novel's rural spaces seem to offer.
- D) King's Cross has a relatively unassuming appearance whose sharp contrast with the more aesthetically pleasing appearance of St. Pancras suggests to Margaret the ascendancy of the pragmatic capitalistic outlook among London's inhabitants.

8

Mexican architect Luis Barragán's prolific career, which spanned the 1920s to the 1980s evolved through distinct phases. After traveling to the United States and Europe in the early 1930s and immersing himself in a broader architectural discourse, Barragán began incorporating principles derived from functionalism and modernism in his work, as seen in the apartment building at 14 Parque Melchor Ocampo, whose unadorned geometric forms contrast with his earlier projects in Guadalajara, such as the Carmen Orozco House, which evince the aesthetics of traditional Mediterranean and Mexican styles.

Information in the text best supports which statement about the design of the Carmen Orozco House?

- A) It represents a transitional moment between the early and late phases of Barragán's development.
- B) It displays the effects of Barragán's exposure to international architectural trends in the 1930s.
- C) It is characteristic of the Guadalajaran architecture that influenced Barragán throughout his career.
- D) It reflects an approach to ornamentation and shape that Barragán later stopped using.

9

The following text is from Mick Herron's 2023 novel *The Secret Hours*. The narrator is describing members of a government committee.

Finally, and adding much needed gravitas, was Sir Winston Day, whose features seemed moulded to adorn a bust, or possibly a stamp, and whose forehead was so evidently bulging with grey matter that it would have been impertinent to inquire too closely into the actual achievements his half century of public service had produced. His recently published memoirs possibly cast light on this enigma, but given that such details were not provided until after the thirty-page mark, they might as well have remained state secrets.

Based on the text, which choice best describes Sir Winston Day?

- A) He has the appearance of a distinguished figure, but it is uncertain whether he has accomplished anything to earn distinction.

- B) He has maintained a modest profile even though he has served the public capably for many years
- C) He looks like a person worthy of respect, but his memoirs reveal that some of his actions were dishonorable.
- D) He would be a celebrated public figure if his achievements did not have to be kept secret

10

Edinburgh, Scotland, has installed engineered structures along 89% of its shoreline to protect infrastructure from wave erosion and other hazards, a practice known as shoreline hardening. To evaluate the responses of waterbirds to two types of hardening structures --- riprap and bulkheads --- Diann Prosser et al. surveyed waterbird communities consisting of the osprey, the common tern, and 62 other species at different sites in the Chesapeake Bay on the US East Coast. Utilizing the Index of Waterbird Community Integrity (IWCI), on which a high score corresponds to high community integrity, the researchers found that bulkheads are more strongly negatively correlated with waterbird community integrity than is riprap.

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

- A) Waterbird communities at Curts, a site with a high percentage of shoreline consisting of bulkheads and riprap, had lower average IWCI scores than did waterbird communities at Onancock, a site with a low percentage of shoreline consisting of bulkheads and riprap.
- B) Waterbird communities at Old Road, a site with a relatively high percentage of shoreline consisting of bulkheads, had lower average IWCI scores than did waterbird communities at Miles, a site with a relatively high percentage of shoreline consisting of riprap.
- C) Waterbird communities at Curtis, a site with equal percentages of shoreline consisting of bulkheads and riprap, had higher average IWCI scores than did waterbird communities at Miles, a site with different percentages of shoreline consisting of bulkheads and riprap.
- D) The difference in average IWCI scores for waterbird communities at Stony and Old Road, two sites with a higher percentage of shoreline consisting of bulkheads than of riprap, was statistically insignificant.

11

For its 2022 exhibition Guarding the Art, the Baltimore Museum of Art cast the security personnel typically responsible for safeguarding the institution's collections as the curators, whose individual selections from the museum's holdings culminated in a show amplifying a distinct perspective not typically given a formal platform.

Which quote from one of the personnel who curated the exhibition would best support the underlined claim?

- A) "The most enjoyable part of curating this show has been seeing the outcome of our efforts: a unique show that spans genres, mediums, cultures, and eras. We hope visitors will sense our genuine affinity for the pieces we are charged with protecting."
- B) "My selections for the show were motivated by an interest in bringing publicity to lesser-known artifacts in the museum's collection, many of which tend to be overlooked or even dismissed as uninteresting by most visitors to the museum."
- C) "The piece I chose is accompanied by a statement of the personal interpretation I've developed over countless hours overseeing the work and interacting with its visitors --- an interpretation that I've previously shared only in small impromptu conversations with those visitors who are interested in discussing their reflections on the piece with me."
- D) "Throughout the exhibition's development, my colleagues and I partnered closely with other museum staff whose areas of expertise lie in curation and conservation, and whose insights enriched our understandings of the pieces we selected for the exhibition."

12

A student is writing an essay on the subject of cultured meat, which is grown in a laboratory and is intended to help reduce the number of livestock harvested for food. The student wants to make the case that cultured meat production may be useful in responding to an expected widespread change in the public's behavior.

Which quotation from a publication by a researcher would most effectively support the student's claim?

- A) "Consumers tend to believe that using less packaging when selling meat products in stores would have a significant effect on the environment."
- B) "The flavor of meat from livestock differs across species (from pig, to chicken to cow), and is also influenced by farming conditions and the breeds and genders of animals."
- C) \*A growing population that is including significantly more meat in its diet will contribute to an increasing demand for meat products in the 21st century."
- D) "Researchers who advocate for the development of lab-grown meat claim that it's better for the environment than conventional meat because it requires less water consumption."

13

Born in Chile in 1917, artist and ethnomusicologist Violeta Parra was a pioneer in the *nueva canción* Chilean (Chilean New Song) movement that emerged in the late 1950s and then spread throughout Latin America, Portugal, and Spain as *nueva canción*. Parra traveled all over Chile compiling extensive records of authentic folk music as well as recipes, proverbs, and other facets of cultural history. These records formed the foundation for the early movement's revival of traditional Chilean folk forms in new songs that represented modern realities of the working class and strongly advocated for social change. As the movement spread beyond Chile, the breadth of musical traditions incorporated into its foundation also expanded.

Which detail about songs associated with *nueva canción*, if true, would best illustrate the underlined claim?

- A) Many feature political commentary addressing contemporary issues that stemmed from shared experiences of European colonization in Latin American countries.
- B) Many demonstrate the stylistic influence of corrido, a genre of narrative songs from Mexico that had come to be characterized by political themes in the early 1800s.
- C) Many were written with parts meant to be played on the quena, a traditional flute used across Andean countries, including Chile.
- D) Many were produced by Argentinian artists in the late 1950s, with others by artists in additional Latin American countries first emerging soon after

14

The National Environmental Policy Act (NEPA) requires us federal agencies to assess environmental effects of potential actions, such as building highways. While many NEPA reviews require public comment, categorical exclusions (CEs) allow quick reviews with no public comment for actions that will minimally affect the environment. In 2020 the rule governing CEs was revised: before, CEs could be granted for actions that "do not individually or cumulatively have a significant effect on the human environment," but the revised rule allowed CEs if actions "normally do not have a significant effect on the human environment."

Environmentalists found this revision to be potentially detrimental because \_\_\_\_\_

which choice most logically completes the text?

- A) the increasing need to build new highways and rehabilitate older highways in the US incentivizes agencies to grant CEs after 2020 for reasons that would not have been considered valid prior to 2020.
- B) the 2020 relaxation of the rule regarding CEs would permit more exclusions, resulting in more reviews of actions by federal agencies and a paradoxically slower review process.
- C) the rule that governed CEs before 2020 allowed expedited reviews of actions that might have significant effects on the environment if those effects were believed to be rare, while the 2020 revision of the rule subjected such actions to slower reviews.

D) the 2020 revision of the rule governing CEs would allow expedited reviews of actions that had a minimal environmental effect when considered on their own but a significant effect when considered together

15

Microbial fuel cells (MFCs) capitalize on the ability of some species of bacteria to metabolize metal, liberating electrons. The bacteria form a dense biofilm on the surface of an electron-collecting anode, but moving the electrons from the bacterial cytoplasm to an external electrode requires that the electrons pass through a series of inefficient oxidation --- reduction (redox) reactions. Accordingly, MFC power output rarely exceeds a density of 0.30 milliwatts per square centimeter ( $\text{mW/cm}^2$ ). In an experiment, researchers added silver nanoparticles to carbon paper covering the anode in an MFC. The resulting power density was  $0.66 \text{ mW/cm}^2$ . Since metals such as silver exhibit high electrical conductivity, the researchers hypothesized that \_\_\_\_\_

which choice most logically completes the text?

- A) silver nanoparticles may increase the metabolic processes of the bacteria, thereby increasing the number of free electrons available to transfer to the electrode.
- B) as the density of the biofilm increases, the series of redox reactions may accelerate independent of the presence of the silver nanoparticles.
- C) electrons may be conducted directly to the electrode before the silver nanoparticles catalyze the redox reactions.
- D) silver nanoparticles may allow electrons to bypass the series of redox reactions and transfer directly to the electrode.

16

Included in *Sertal intent*, a 2017 group exhibition at the Akron Art Museum in Ohio, was the work of artist Lorna Simpson, who is best known for her multimedia artworks that juxtapose images of African American women with text fragments. Her work challenges conventional notions of race, gender, history, and \_\_\_\_\_ she is credited with expanding the horizons of conceptual photographic art.

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

- A) memory,
- B) memory and
- C) memory
- D) memory, and

17

Enacted in 2006, Nepal's constitution, according to legal \_\_\_\_\_ contains all of the six constitutional features that enhance judicial independence. Explicit provisions for judicial independence, Melton and Ginsburg's research explains, are more likely to be found in constitutions enacted after 1985.

which choice completes the text so that it conforms to the conventions of standard English?

- A) researchers James Melton and Tom Ginsburg
- B) researchers James Melton and Tom Ginsburg.
- C) researchers, James Melton and Tom Ginsburg
- D) researchers, James Melton and Tom Ginsburg,

18

Although 60558 Echeclus and 2014 YX49 are both classified as centaur objects --- outer solar system bodies in unstable orbits --- they exhibit striking differences in \_\_\_\_\_. Object 60558 Echeclus is considered an active centaur, showing sporadic comet-like activity (such as clouds of dust and gas on its surface), 2014 YX49, showing no such activity, is considered dormant.

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

- A) behavior. The
- B) behavior: while the
- C) behavior while the
- D) behavior; the

19

In a US national election, one might expect major-party campaigns to focus on the most populous states. However, if polls and past voting data suggest that the outcome in a given state is a foregone conclusion, a campaign will not invest its resources there. Ultimately, a state's voting record and polling data, not its population size, \_\_\_\_\_ its importance to campaigns.

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

- A) has determined
- B) determines
- C) determining
- D) determine

20

That the repeated thermonuclear outbursts of U Scorpii, a recurrent nova system consisting of a white dwarf star and a companion star, have occurred on timescales as brief as eight years --- shorter intervals between outbursts than have been observed in some other novae of its class --- to the white dwarf's extremely large mass and rapid accretion of hydrogen from its companion star.

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

- A) is due
- B) due
- C) being due
- D) having been due

21

In his 2011 book, historian Sebouh David Aslanian quantifies the reading patterns of early modern Armenian merchants from New Julfa. Aslanian's macroanalysis \_\_\_\_\_ nearly 1,000 book titles published between 1512 and 1800 shows not only the steady popularity of religious texts but also a broadening interest in secular books, especially those on history and geography.

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

- A) had examined
- B) examining
- C) examines
- D) examined

22

Scientists studying asteroid deflection have focused on secondary objects such as S/2020(2013 PY6), a moonlet orbiting the near-Earth asteroid 2013 PY6. In 2022 NASA intentionally crashed a probe into just such an object, the moonlet Dimorphos. \_\_\_\_\_ Dimorphos's orbital period around the near-Earth asteroid Didymos was permanently altered.

Which choice completes the text with the most logical transition?

- A) In comparison,
- B) In addition,
- C) Consequently,
- D) Specifically,

23

According to the free electron model, metals, such as copper and silver, do not maintain bonds by sharing and exchanging electrons. \_\_\_\_\_ metals are held together by a system of valence electrons that travel freely, interacting with neither ions nor each other. This framework for understanding the subatomic relationships within metals can be used to help explain heat and electrical conductivity.

which choice completes the text with the most logical transition?

- A) For example,
- B) Rather,
- C) Accordingly,
- D) Likewise,

24

In an ekphrastic poem, a poet explores a work of visual art, such as a drawing, sculpture, or painting. Robert Hayden's 1994 poem "Monet's Waterlilies," for example, meditates on Claude Monet's 1899 painting Water Lilies: Saad Ali's 2020 poem "This Town," \_\_\_\_\_ takes a painting as its subject: Ivan Aivazovsky's 1859 work Liar Night on the Black sea.

which choice completes the text with the most logical transition?

- A) nevertheless,
- B) conversely,
- C) likewise,
- D) hence,

25

Firefly luciferase (Fluc) is a distinctly evolved enzyme that can oxidize a substrate called D-luciferin to induce bioluminescence and can act as a fatty acyl-CoA synthetase (ACS) enzyme, a class of enzyme present in all insects. \_\_\_\_\_ Fluc is a bifunctional enzyme whose presence indicates an insect is capable of emitting light; in contrast, the presence of ACS alone would be insufficient for determining bioluminescence.

which choice completes the text with the most logical transition?

- A) Nevertheless,
- B) In fact,
- C) Moreover,
- D) That is,

26

- The South Sudan Workers Trade Union Federation (SSWTUF) is a national union federation for the African nation of South Sudan.
- It helps improve conditions for workers in that nation.
- ITUC-Africa is a regional union federation that represents national union federations across Africa.
- It represents the SSWTUF

Which choice most effectively uses information from the given sentences to explain the purpose of national union federations?

- A) The SSWTUF is a national union federation in Africa.
- B) National union federations, such as the SSWTUF, work to improve conditions for workers in their member nations.
- C) The SSWTUF is one of the national union federations represented by ITUC-Africa.
- D) Regional union federations like ITUC-Africa represent the national union federations in a specific area.

27

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

- Generally, an object will heat up when twisted.
- The twisting of an object is known as torsion.
- A 2019 study led by Zunfeng Liu and Ray Baughman tested the torsional heating of various fibers.
- When a sample of styrene-ethylene-butylene-styrene (SEBS) rubber fiber was twisted, its average surface temperature increased by 3.5°C.
- When a sample of single-ply nickel-titanium (NiTi) wire was twisted, its average surface temperature increased by 21.3°C.

The student wants to emphasize a similarity between SEBs rubber and single-ply NiTi wire fibers. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- A) In 2019, two research teams observed the effects of torsional heating on various fibers, including SEBs rubber and single-ply NiTi wire.
- B) Both EEBs rubber and single-ply NiTi wire fibers heat up when twisted, according to a 2019 study.
- C) Researchers determined that when the fibers were twisted, the average surface temperature of single ply NiTi wire increased more than that of SEBs rubber.
- D) Twisting an object will generally cause its temperature to increase, a process known as torsional heating.

## Math Module 1

22 QUESTIONS

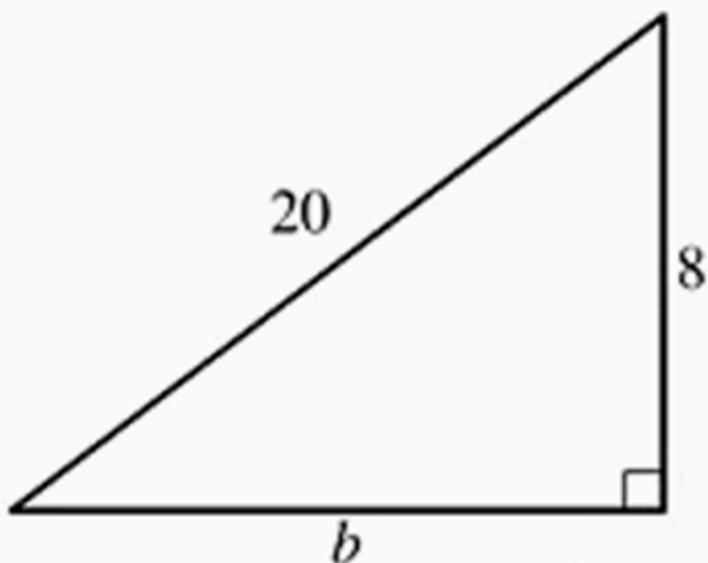
1

$$s = 40 + 2t$$

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 4 seconds after it began to accelerate?

- A) 40
- B) 42
- C) 44
- D) 48

2



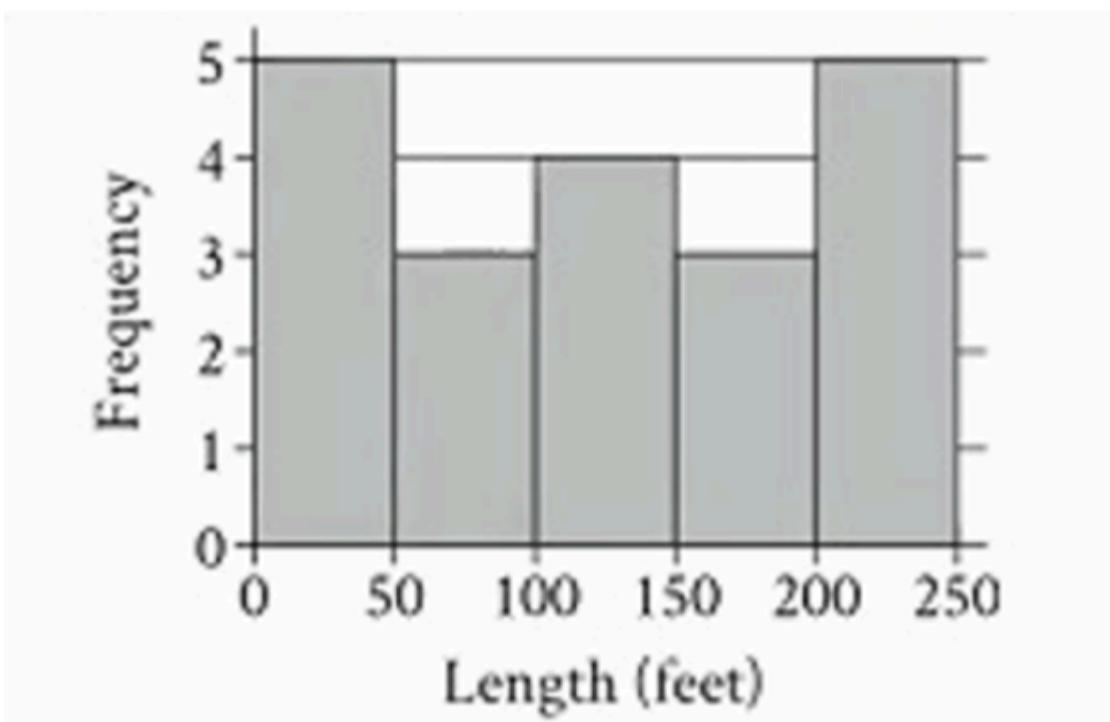
Note: Figure not drawn to scale.

4

Which equation shows the relationship between the side lengths of the given triangle?

- A)  $8b = 20$
- B)  $8 + b = 20$
- C)  $8^2 + b^2 = 20^2$
- D)  $8^2 - b^2 = 20^2$

3



The histogram shows the distribution of 20 lengths, in feet, in a data set. The first bar represents the lengths that are less than 50 feet, the second bar represents the lengths that are at least 50 feet but less than 100 feet, and so on. Which of the following could be the maximum length, in feet, in this data set?

- A) 69
- B) 119
- C) 169
- D) 219

4

$$y = -0.5$$

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

In the given system of equations,  $a$  is a positive integer constant. The system has no real solutions. What is the least possible value of  $a$ ?

5

$$7x + 28 = 72 + k$$

In the given equation,  $k$  is a constant. The equation has infinitely many solutions. What is the value of  $k$ ?

6

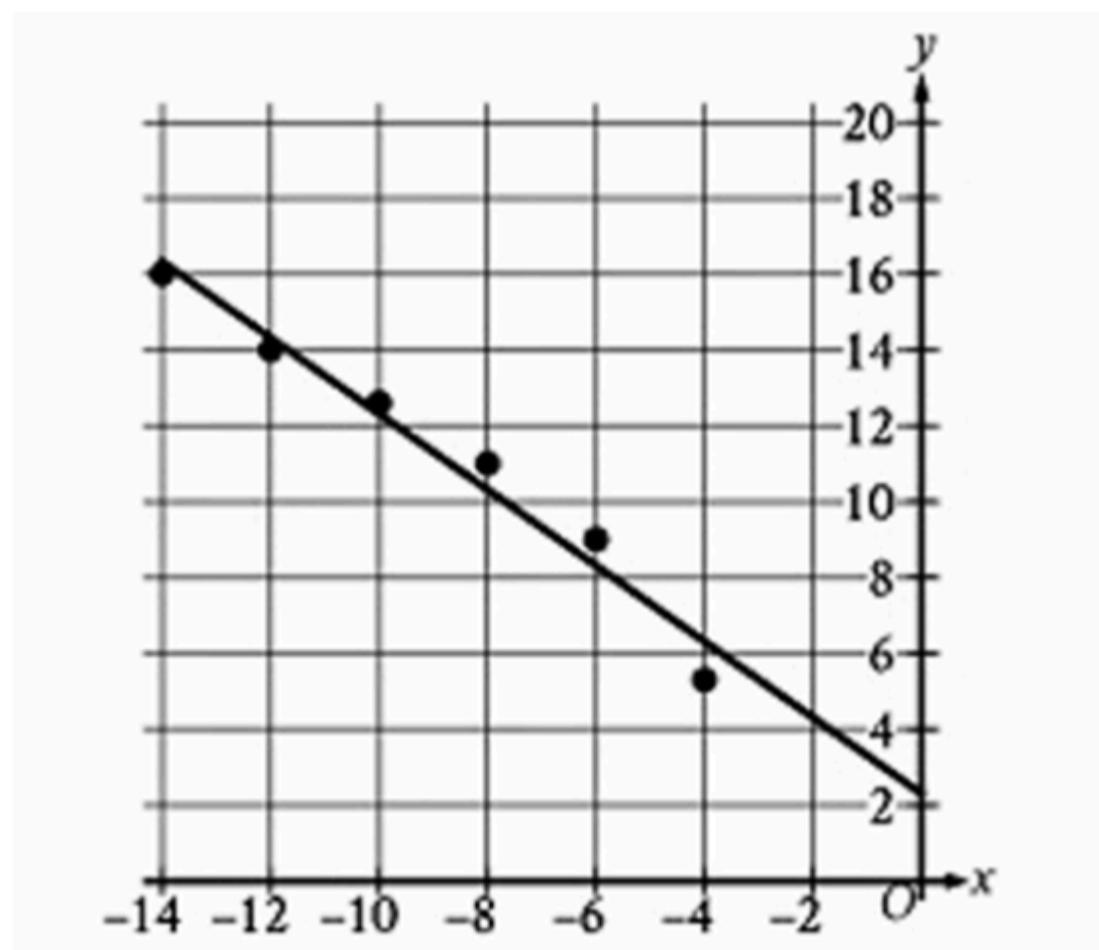
A line segment that has a length of 113 centimeters (cm) is divided into three parts. One part is 47 cm long. The other two parts have lengths that are equal to each other. What is the length, in cm, of one of the other two parts of equal length?

7

The function  $f$  is defined by  $f(x) = 3x - 1/4$ . What is the  $y$ -intercept of the graph of  $y = f(x)$  in the  $xy$ -plane?

- A)  $(0, -1/4)$
- B)  $(0, -3)$
- C)  $(0, 3)$
- D)  $(0, 4)$

8



The scatterplot shows the relationship between two variables,  $x$  and  $y$ . A line of best fit is also shown. Which of the following equations best represents the line of best fit shown?

- A)  $y = x - 16.3$
- B)  $y = -x + 16.3$
- C)  $y = x - 2.3$
- D)  $y = -x + 2.3$

9

The expression  $7x^6 + 9x^6 - 8x^6$  is equivalent to  $bx^6$ , where  $b$  is a constant. What is the value of  $b$ ?

10

At what point  $(x, y)$  do the graphs of the equations  $y = 5x + 8$  and  $y = 6x - 2$  intersect in the  $xy$ -plane?

- A) (5,6)
- B) (6,5)
- C) (10,58)
- D) (58,10)

11

A rectangle has a length that is 72 times its width. The function  $y = (72w)(w)$  represents this situation, where  $y$  is the area, in square feet, of the rectangle and  $y > 0$ . Which of the following is the best interpretation of  $72w$  in this context?

- A) The length of the rectangle, in feet
- B) The area of the rectangle, in square feet
- C) The difference between the length and the width of the rectangle, in feet
- D) The width of the rectangle, in feet

12

$$f(x) = 29$$

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

A)

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

B)

$x$	$f(x)$
0	29
1	29
2	29

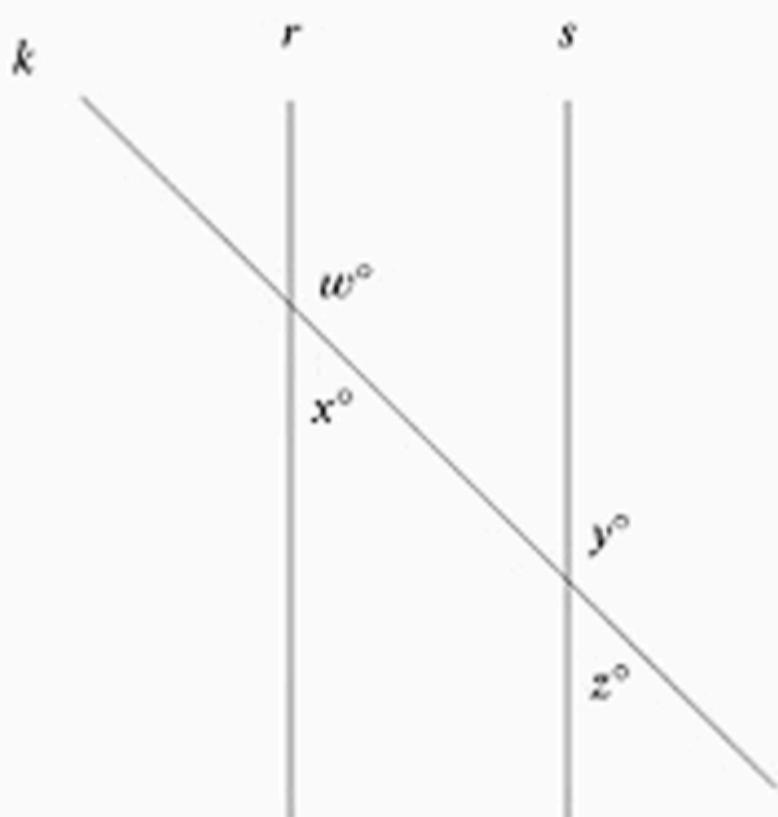
C)

$x$	$f(x)$
0	0
1	29
2	58

D)

$x$	$f(x)$
0	29
1	0
2	-29

13



Note: Figure not drawn to scale.

In the figure shown, line  $k$  intersects lines  $r$  and  $s$ . If  $w = 160$ , which additional piece of information is sufficient to prove that lines  $r$  and  $s$  are parallel?

- A)  $x = 20$
- B)  $y = 160$
- C)  $w + y = 180$
- D)  $y + z = 180$

14

$$x^2 - 4x + y^2 - 8y - 80 = 0 \leftarrow$$

In the  $xy$ -plane, the graph of the given equation is a circle. If this circle is inscribed in a square, what is the perimeter of the square?  $\leftarrow$

- A) 20

- B) 40
- C) 80
- D) 320

15

A real estate company offers a series of three webinars. 1,250 people attended the first webinar, 46% of the people who attended the first webinar attended the second webinar and 32% of the people who attended the first and second webinars attended the third webinar. How many people attended all three webinars?

16

$$f(x) = 24(2)^{x/6}$$

Which table gives four values of  $x$  and their corresponding values of  $f(x)$  for the given exponential function?

A)

$x$	-6	0	6	12
$f(x)$	12	0	48	96

B)

$x$	-6	0	6	12
$f(x)$	12	24	48	96

C)

$x$	-6	0	6	12
$f(x)$	-12	24	48	96

D)

$x$	-6	0	6	12
$f(x)$	12	24	48	72

17

A school is ordering tablet computers for its students. The tablets cost \$170 each, and 7% tax is added to the total cost of the order. If the school can spend no more than \$53,400 dollars on the tablets, including tax, what is the maximum number of tablets that the school can order?

18

To study fluctuations in leaf water potential, samples of wood were taken from 22 trees and cut in the shape of a cube. The length of the edge of one of these cubes is 3.000 centimeters. This cube has a density of 0.250 grams per cubic centimeter. What is the mass of this cube, in grams?

19

$-2 | 5x+9 | + 7 = -11$ . What are all solutions to the given equation?

- A) 0
- B) 0 and  $-7/5$
- C) 0 and  $-18/5$
- D) There is no solution.

20

$$x^2 - 84x - 14 = 0 \leftarrow$$

what is the sum of the solutions to the given equation?  $\leftarrow$

- A) 0
- B) 7
- C) 14
- D) 84

21

For the right circular cone shown, B is a point on the circumference of the base, and the length of segment AB (not shown) is 32 centimeters. If the height of the cone is 16 centimeters and the volume of the cone is  $k\pi$  cubic centimeters, what is the value of k?

22

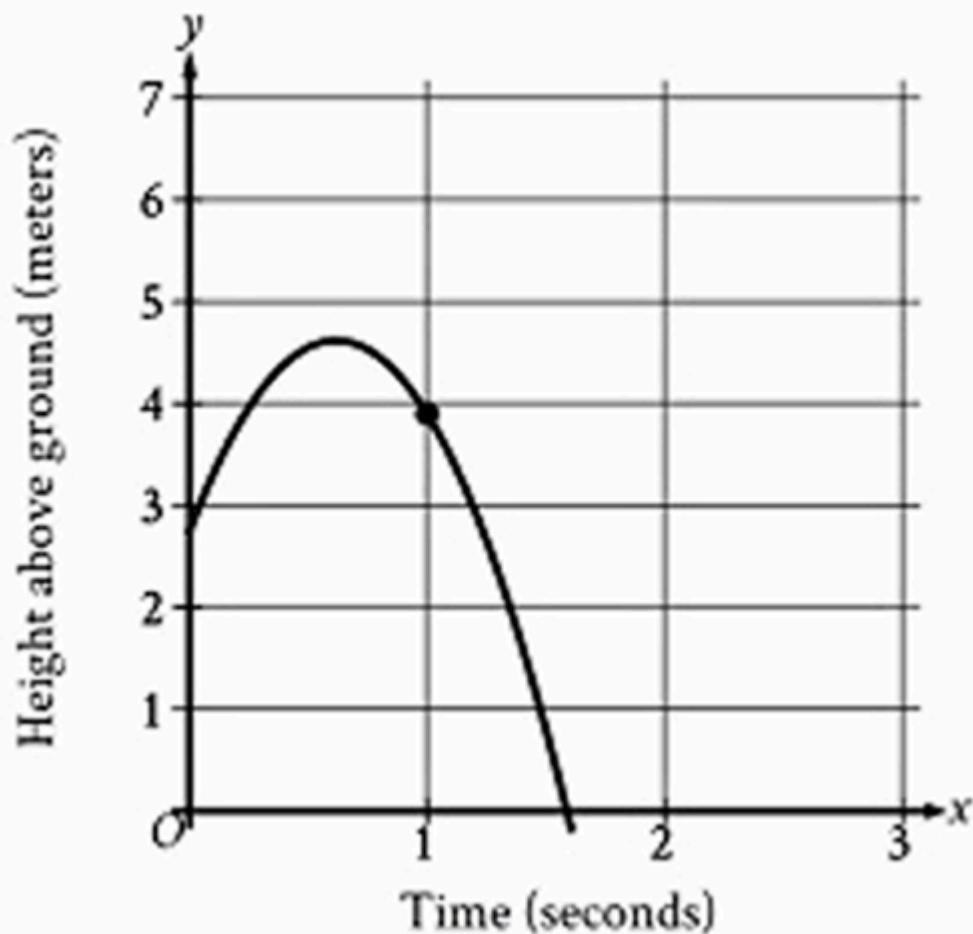
In the xy-plane, line k and line l are perpendicular and intersect at the point (2, 8). If line k is defined by the equation  $y = mx + b$ , where m and b are constants and  $m > 1$ , which of the following points lies on line l?

- A)  $(3, 8 - 1/m)$
- B)  $(3, 8 + 1/m)$
- C)  $(3, 8 - m)$
- D)  $(3, 8 + m)$

## Math Module 2

22 QUESTIONS

1



The graph shows the height above ground, in meters, of a ball  $x$  seconds after the ball was launched upward from a platform. Which statement is the best interpretation of the marked point  $(1.0, 3.9)$  in this context?

- A) 1.0 second after being launched, the ball's height above ground is 3.9 meters
- B) 3.9 seconds after being launched, the ball's height above ground is 1.0 meter
- C) The ball was launched from an initial height of 1.0 meter with an initial velocity of 3.9 meters per second.
- D) The ball was launched from an initial height of 3.9 meters with an initial velocity of 1.0 meter per second.

2

In one week in 2017, a technician earned a total of \$700 by working at her regular job and at a second job doing part-time work. The equation  $16h + 13c = 700$  represents this situation, where  $h$  is the number of hours worked at her regular job and  $c$  is the number of hours worked at her second job. Which of the following is the best interpretation of 16 in this context?

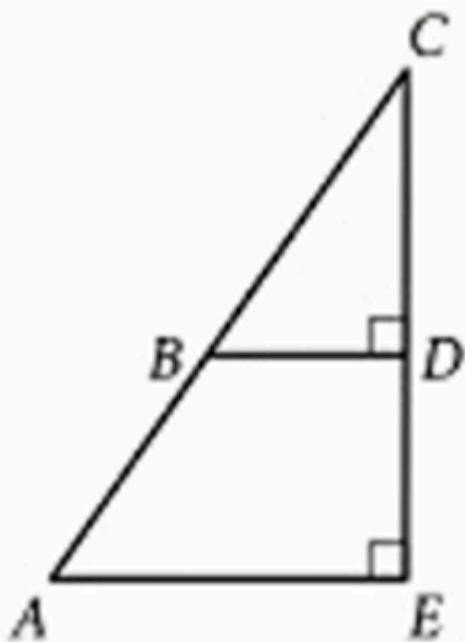
- A) The amount, in dollars, the technician earned for each hour she worked at her regular job
- B) The amount, in dollars, the technician earned for each hour she worked at her second job
- C) The number of hours the technician worked in one week at her regular job
- D) The number of hours the technician worked in one week at her second job

3

Which of the following lists represents a data set with the smallest standard deviation?

- A) 44, 45, 47, 49, 50
- B) 45, 45, 47, 49, 49
- C) 45, 46, 47, 48, 49
- D) 46, 47, 47, 47, 48

4



Note: Figure not drawn to scale.

In the figure shown, triangle CAE is similar to triangle CBD. The measure of angle CBD is  $56^\circ$ , and  $AE=24(BD)$ . What is the measure of angle CAE?

- A)  $24^\circ$
- B)  $56^\circ$
- C)  $(24+56)^\circ$
- D)  $(24*56)^\circ$

5

At a convention center, there are a total of 375 visitors. Each visitor is located in either room A, room B, or room C. If one of these visitors is selected at random, the probability of selecting a visitor who is located in room A is 0.64, and the probability of selecting a visitor who is located in room B is 0.32. How many visitors are located in room C?

- A) 4
- B) 15
- C) 77
- D) 120

6

$$y = \frac{x}{4} + 6$$

$$y = -\frac{x}{4} + 20$$

The solution to the given system of equations is  $(x, y)$ . what is the value of  $2y$ ?

- A) 26
- B) 20
- C) 14
- D) 6

7

In 5 days, a polar bear ate 22.0 pounds of fat. Which equation describes the amount of fat  $y$ , in pounds, the polar bear ate in these 5 days?

- A)  $y = 22 + 5$
- B)  $y = 22$

C)  $y = 22 / 5$

D)  $y = 5$

8

A researcher observes a sample of a nuclide. An exponential model estimates that the mass, in grams, of the sample decreases by 22% every 11.11 minutes. Which of the following equations could represent this model, where  $M$  is the estimated mass, in grams, of the sample  $t$  minutes after the researcher began observing the sample?

A)  $M = 100 (0.22)^{t+11.11}$

B)  $M = 100 (0.22)^{t/11.11} \leftarrow$

C)  $M = 100 (0.78)^{t+11.11} \leftarrow$

D)  $M = 100 (0.78)^{t/11.11} \leftarrow$

9

Line  $k$  is defined by  $y = 8x + 7$ . Line  $j$  is parallel to line  $k$  in the  $xy$ -plane and passes through the point  $(0, 15)$ . Which equation defines line  $j$ ?

A)  $y = 15x + 7$

B)  $y = -15x + 7$

C)  $y = 8x + 15$

D)  $y = -8x + 15$

10

For the linear function  $p$ ,  $p(c) = -6$ , where  $c$  is a constant,  $p(5) = 42$ , and the slope of the graph of  $y = p(x)$  in the  $xy$ -plane is 8. For the linear function  $t$ ,  $t(c) = -7$  and  $t(6) = 56$ . What is the slope of the graph of  $\frac{1}{4}t(z) = t(z)$  in the  $xy$ -plane?

A) -1

B) 2

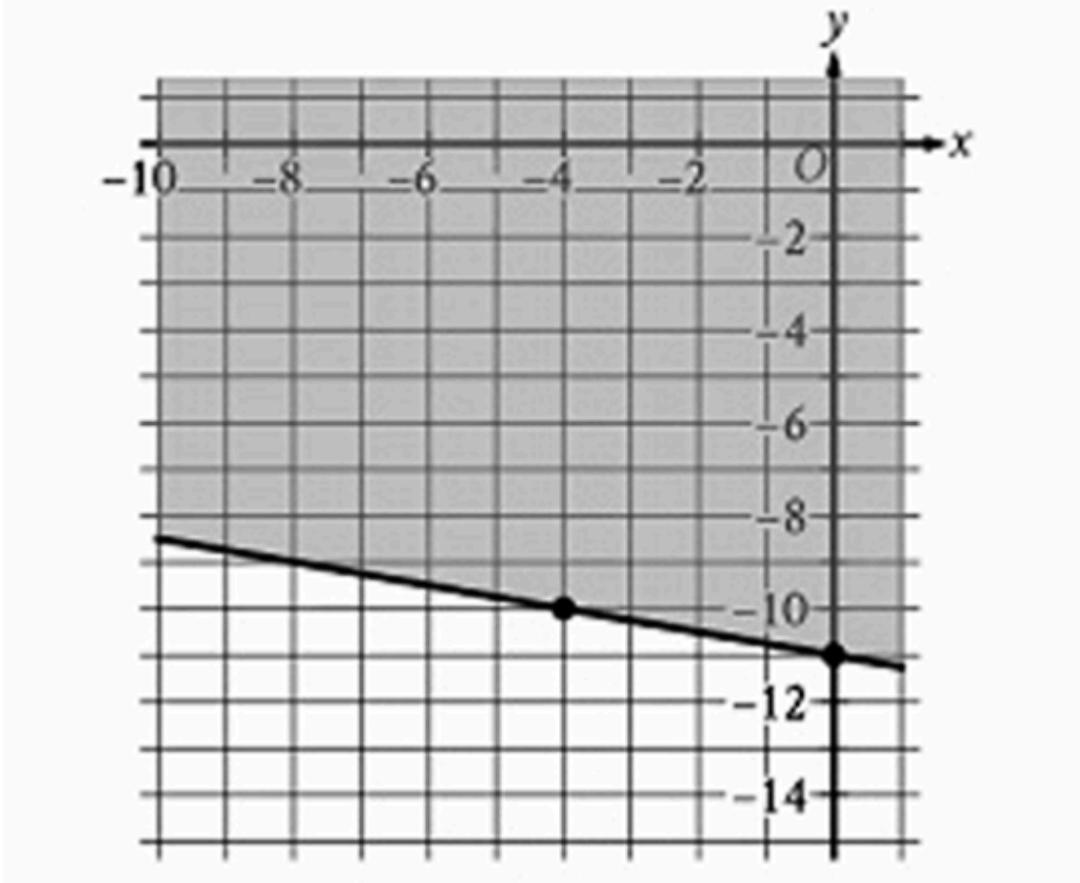
C) 8

D) 9

11

If  $2(4-5x) + 7(4-5x) + 9 = 8(4-5x) + 6$ , what is the value of  $5x - 4$ ?

12



The shaded region shown represents the solutions to  $rx + ty \geq 44$ , where  $r$  and  $t$  are constants. What is the value of  $r + t$ ?

- A) -4
- B) -3
- C) 3
- D) 5

13

$$f(x) = \sqrt{3x + 8}$$

The function  $f$  is defined by the given equation. If  $f(a) = -9a$ , where  $a$  is a constant, what is the value of  $a$ ?

- A)  $1/3$
- B)  $8/27$
- C)  $-8/27$
- D)  $-1/3$

14

The edge length, in inches, of cube Y is  $3/86$  the edge length, in inches, of cube X. The surface area, in square inches, of cube Y is  $n$  times the surface area, in square inches, of cube X. What is the value of  $n$ ?

- A)  $9 / 7396$
- B)  $27 / 3608$
- C)  $3/86$
- D)  $9/43$

15

The function  $f$  is a quadratic function. In the  $xy$ -plane, the graph of  $y = f(x)$  has a vertex at  $(1, 6)$  and passes through the points  $(2, 40)$  and  $(-1, 142)$ . What is the value of  $f(-2) - f(0)$ ?

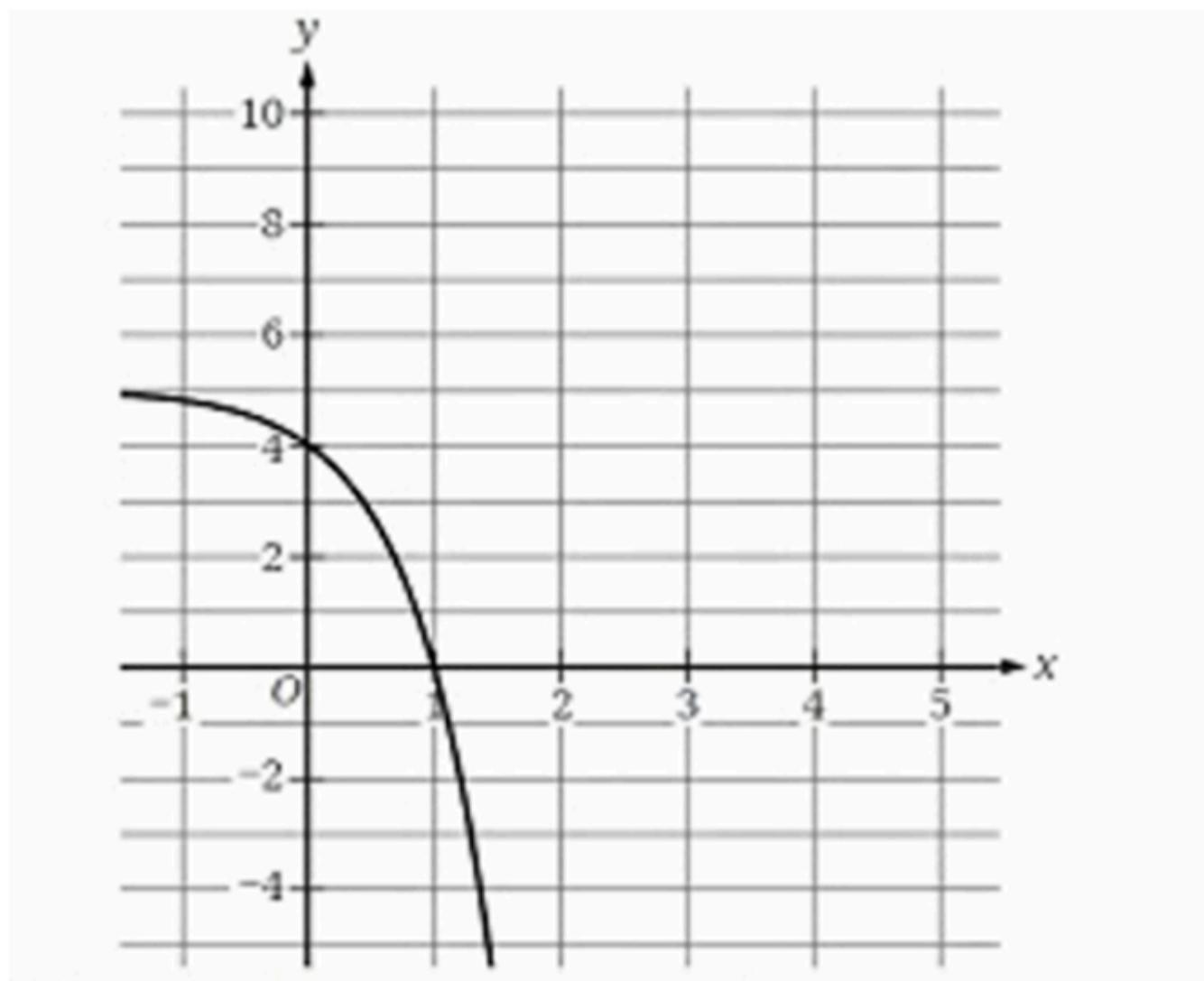
- A) 108
- B) 176
- C) 272

16

Which expression is equivalent to  $15(x + 10)$ ?

- A)  $15x+10$
- B)  $15x+150$
- C)  $15x+25$
- D)  $15x+5$

17



The graph of  $y = f(x) + 2$  is shown. Which equation defines function  $f$ ?

- A)  $f(x) = -5^x + 1$
- B)  $f(x) = -5^x + 3$
- C)  $f(x) = -5^x + 4$
- D)  $f(x) = -5^x + 5$

18

A square map has a side length of 45 inches, and 1 inch on the map represents an actual distance of 13 miles. A smaller version of the same map is printed as a square with the side length 70% shorter than the side length of the previous map. On the smaller map, which of the following is closest to the actual distance, in miles, represented by 1 inch?

- A) 3.90
- B) 7.65
- C) 31.50
- D) 43.33

19

In triangle ABC, the measure of angle A is  $58^\circ$  and AC= 30. In triangle POR, the measure of angle P is  $58^\circ$  and PR= 120. Which additional piece of information is sufficient to prove that triangle ABC is similar to triangle PQR?

- A) AB=35 and PQ = 35.
- B) AB=35 and QR= 140.
- C) The measures of angle B and angle R are  $34^\circ$  and  $88^\circ$ , respectively
- D) The measures of angle B and angle Q are  $58^\circ$  and  $34^\circ$ , respectively.

20

Right rectangular prism X is similar to right rectangular prism Y. The surface area of rectangular prism X is 59 square centimeters ( $\text{cm}^2$ ), and the surface area of right rectangular prism Y is  $1,475 \text{ cm}^2$ . The volume of right rectangular prism Y is 1,500 cubic centimeters ( $\text{cm}^3$ ). What is the sum of the volumes, in  $\text{cm}^3$ , of right rectangular prism X and right rectangular prism Y?

21

The function  $f$  is defined by  $f(x)= ab^{x/n}$ , where  $a$ ,  $b$ , and  $n$  are constants, and  $b$  and  $n$  are integers.

If  $f(2)=6$  and  $f(5)=162$ , what is the value of  $f(7)$ ? $\leftarrow$

$\leftarrow$

22

In triangle ABC, the measure of angle B is  $90^\circ$  and BD is an altitude of the triangle. The length of AB is 24 and the length of AC is 13 greater than the length of AB. what is the value of BC/BD?

- A)  $13/24$
- B)  $24/37$
- C)  $37/24$
- D)  $24/13$

## Reading and Writing Module 1 Answers

1. A
2. A
3. A
4. A
5. A
6. A
7. D
8. A
9. A
10. C
11. D
12. B
13. C
14. A
15. A

16. B  
17. C  
18. A  
19. C  
20. B  
21. B  
22. B  
23. B  
24. B  
25. A  
26. A  
27. A

## Reading and Writing Module 2 Answers

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

## Math Module 1 Answers

1. D  
2. C

3. D  
4. 16  
5. 28  
6. 33  
7. A  
8. D  
9. 8  
10. C  
11. A  
12. B  
13. B  
14. C  
15. 184  
16. B  
17. 293  
18.  $27/4$ ; 6.75  
19. C  
20. D  
21. 4096  
22. A

## Math Module 2 Answers

1. A  
2. A  
3. D  
4. B  
5. B  
6. A  
7. B  
8. D  
9. C  
10. D  
11. 3  
12. D  
13. C  
14. A  
15. C  
16. B  
17. B  
18. D  
19. C  
20. 1512  
21. 1458  
22. C