

# Reading and Writing Module 1

## 27 QUESTIONS

1

The Apollo Moon landings (1969-1972) brought atmosphere sensor's and seismic sensors to the Moon and produced large amounts of data. Researcher Renee Weber who is investigating tectonic activity 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) displaced
- B) ongoing
- C) original
- D) controversial

2

Because cyanobacteria and other microphytobenthos (MPB) --- microscopic organisms inhabiting tidal flats -- - are consumed by mussels as well as by certain shorebirds and fish, MPB are \_\_\_\_\_ estuary ecosystems. Decreased MPB abundance, which may be caused by environmental stressors, thus has a direct, negative impact on coastal food webs.

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

- A) imperative for
- B) emblematic of
- C) subordinate to
- D) interchangeable with

3

Some pieces of music might have many meanings --- the compositions of Charlotte Moorman can \_\_\_\_\_ as many different interpretations as there are people to listen to them --- and so as long as a listener's interpretation isn't willfully absurd or the result of inattention, it is difficult to justify the claim that the listener has misunderstood the piece.

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

- A) refute
- B) omit
- C) support
- D) evade

4

The inventories of consonant sounds among the Polynesian languages of the Pacific tend toward the \_\_\_\_\_: Sikaiana in the South Pacific has a total of nine consonants, and Olelo Hawai'i, the language of the native Hawaiian people, has one fewer, while the global median per language is over twenty-two.

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

- A) minimal

- B) static
- C) replicable
- D) melodic

5

Founded in Long Beach, California, in 1996, the Museum of Latin American Art is dedicated to modern and contemporary art by Latin American artists and Latino artists in the United States. Since its founding, it has acquired more than 1,300 objects for its permanent collection. More recently founded US-based institutions devoted to Latino cultures include Casa de Rosado. Located in Lansing, Michigan, it focuses on the arts and cultures of Latino communities in Michigan.

Which choice best states the main purpose of the text?

- A) To trace a historical development that encouraged the founding of two institutions
- B) To trace the founding of two institutions, including how they acquired funding to purchase artworks
- C) To present information about two institutions, including each institution's area of focus
- D) To draw a contrast between the collection sizes of two institutions

6

The following text is adapted from D.A. Lozano's 1844 poem "A Remembrance of Puerto Cabello --- The Mangle" (translated by Agnes Blake Poor in 1918). The poem is a dedication to Puerto Cabello, a town on the northern coast of Venezuela.

And while outside the tempest is raving o'er the ocean,

And the ship is madly driving on some lone and desert shore;

Thy warm and land-locked waters swell with an easy motion.

And gently glides the light pirogue [canoe] at dipping of the oar.

Which choice best states the main purpose of the text?

- A) It describes the speaker's attitude towards the day-to-day life in Puerto Cabello.
- B) It contrasts the tranquility of the waters near Puerto Cabello with the roughness of waters elsewhere.
- C) It emphasizes the severity of a storm that is expected to arrive soon in Puerto Cabello.
- D) It compares the appearance of two types of boats.

7

In what is now New Mexico, the Pueblo of Pojoaque operates the Poeh Cultural Center. Relying on traditional knowledge to guide the design of exhibits, this institution presents Pojoaque history and culture to the tribe's citizens. The Tohono O'odham Nation, a tribe in Arizona, employs a similar strategy in its own cultural center. Both centers contrast with museums that aren't Indigenous-led; when displaying Indigenous artifacts, such museums tend to anticipate mainly non-Indigenous audiences and rely on Euro-centric strategies for designing exhibits.

According to the text, what is one way that non-Indigenous museums typically differ from the cultural centers operated by the Pueblo of Pojoaque and the Tohono O'odham Nation?

- A) The museums typically feature fewer artifacts in their exhibits.

- B) The museums are often somewhat smaller in size.
- C) The museums are largely aimed at non-Indigenous audiences.
- D) The museums focus on tribal history as well as tribal culture.

8

The Hawaiian archipelago is home to the kiwiku (Pseudonestor xanthophrys), one of several bird species that can only be found on the islands. Due to Hawai'i's uniquely varied geographic and ecological conditions, the kiwiku became highly specialized as it adapted to survive in a specific island habitat. However, like many highly specialized species, the kiwiku is particularly vulnerable to environmental stressors, such as disease, invasive species, and habitat destruction, that disrupt the delicately balanced ecosystems in which the birds live.

Based on the text, why is the kiwiku a highly specialized species?

- A) It lives exclusively in the most geographically isolated locations on the Hawaiian archipelago.
- B) It adapted over time to live in a specific habitat found on the Hawaiian archipelago.
- C) It adapted over time to share a habitat with other highly specialized bird species on the Hawaiian archipelago.
- D) It lives in a habitat that is exposed to numerous environmental stressors.

9

The following text is adapted from Guy de Maupassant's 1884 short story "A Recollection, from the collection Guy de Maupassant Short Stories (translated by Albert M.C. McMaster et al. in 1903). The narrator is taking a boat down the Seine river from Paris, France, to the surrounding countryside.

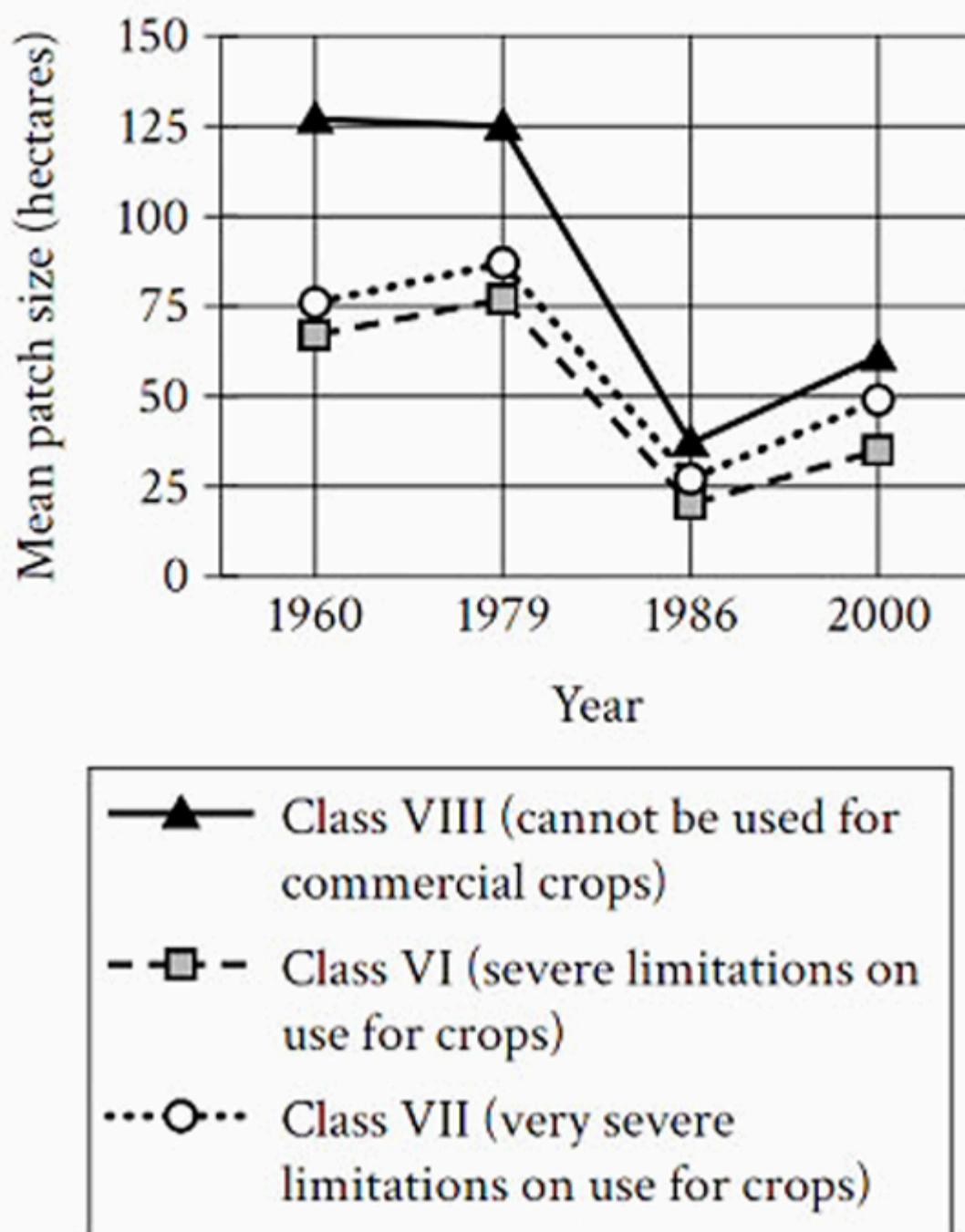
I took up a position in the bows [front of the boat], standing up and looking at the quays, the trees, the houses and the bridges disappearing behind us. And suddenly I perceived the great viaduct of Point du Jour which blocked the river. It was the end of Paris, the beginning of the country, and behind the double row of arches the Seine, suddenly spreading out as though it had regained space and liberty, became all at once the peaceful river which flows through the plains, alongside the wooded hills, amid the meadows, along the edge of the forests.

Which choice best states the main idea of the text?

- A) The narrator contrasts his feelings of apprehension with the apparent tranquility of the river as the boat enters the countryside
- B) The narrator is anxious for the trip to the countryside to be over as quickly as possible, and is frustrated that it is taking so long.
- C) Though the narrator did not expect to be leaving the city on this trip, he is nonetheless excited to undertake this new adventure.
- D) The narrator perceives a parallel between the shift from the urban environment to the countryside and the changes in the features of the river itself.

10

## in the Chorotega Region, Costa Rica

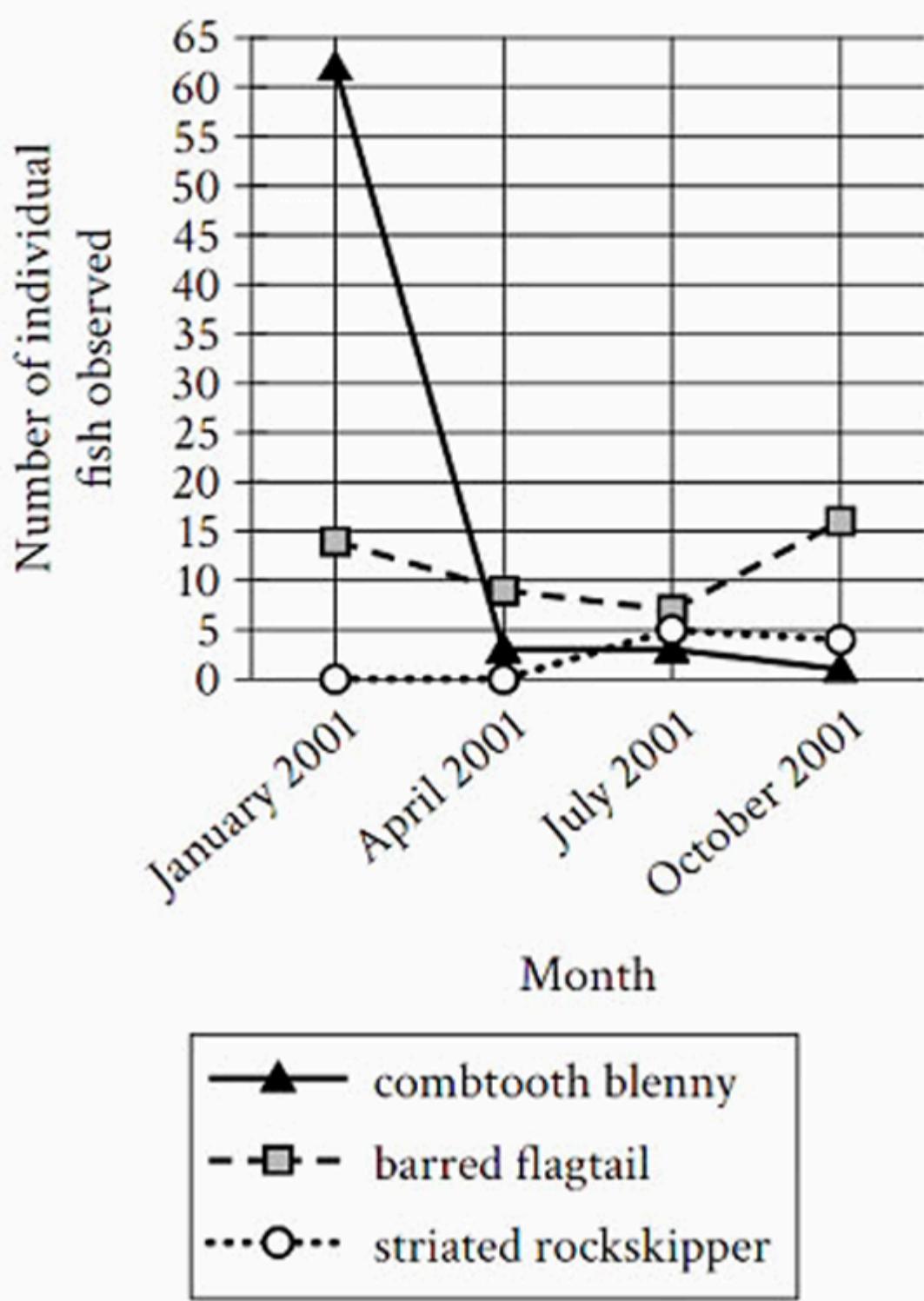


To understand the extent of deforestation in the Chorotega region of Costa Rica, Juan Pablo Arroyo-Mora and colleagues used historical aerial photography and remote sensing data to track changes in the annual mean size of forest patches across different land use capability classes (categories that indicate possible uses of forest land). Due to the Chorotega region's climate, various types of forested areas were converted to cattle pasture as rising international meat prices drove a cattle ranching boom in the 1960s and 1970s. By 1986, mean forest patch sizes had dropped considerably. In that year, they were between \_\_\_\_\_

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

- A) 100 and 125 hectares.
- B) 125 and 150 hectares.
- C) 200 and 250 hectares.
- D) 0 and 50 hectares.

Fish Population in a Taiwanese Tide Pool, January 2001 to October 2001



Lin-Tai Ho and colleagues monitored fish populations in a tide pool in Taiwan. They found that some species were entirely absent from the tide pool at particular times of the year, for example, they did not observe even one \_\_\_\_\_.

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

- A) barred flagtail in January of 2001.
- B) striated rock skipper in January and April of 2001.
- C) barred flagtail in October of 2001.
- D) combtooth blenny in January of 2001.

12

Paleontologist Amane Tajika and colleagues analyzed the shells of two marine mollusks called nautilids that were collected from waters near New Caledonia. Sample F13 and other shell sections formed during adulthood suggest that mature New Caledonian nautilids live at the same depths as mature Fijian nautilids. However, sample Mo6, which formed while the nautilid was still in its egg, had a chemical signature suggesting the egg had been laid in water 120 meters deep, while Fijian nautilids typically lay eggs at depths of at least 170 meters. Because water temperature decreases as depth increases, a biology student hypothesized that the New Caledonian nautilids lay their eggs in warmer water than Fijian nautilids do.

Which finding, if true, would most directly weaken the student's hypothesis?

- A) New Caledonia nautilids tend to migrate upward to warmer water immediately after hatching, whereas Fijian nautilids do not.
- B) The water temperature at a given depth tends to be higher in waters near Fiji than it is at that depth in waters near New Caledonia.
- C) There aren't enough suitable hatching areas at a depth of at least 170 meters in New Caledonia for nautilids to lay their eggs at that depth.
- D) The water temperature at a given depth tends to be lower in waters near Fiji than it is at that depth in waters near New Caledonia.

13

Many studies have found a positive association between levels of dissolved organic carbon and mercury in bodies of fresh water in North America. But Petri Porvari and Matti Verta did not find this correlation in a study conducted in Finland, leading some scientists to hypothesize that the pattern is particular to North America. However, Yao Luo and colleagues reported dissolved organic carbon and mercury rising or falling together in a study conducted in China, and several other studies from outside North America have yielded similar results, suggesting that \_\_\_\_\_

Which choice most logically completes the text?

- A) environmental characteristics unique to Finland likely result in dissolved organic carbon and mercury levels in bodies of fresh water both being significantly higher there than elsewhere.
- B) the bodies of water examined in Porvari and Verta's study may be more similar to the bodies of water examined in studies conducted in North America than to those examined in Luo and colleagues' study.
- C) there may be circumstances specific to the bodies of water examined in Porvari and Verta's study that disrupted a general positive association between dissolved organic carbon and mercury levels.
- D) bodies of fresh water outside North America are more likely to show a negative association between dissolved organic carbon and mercury levels than a positive association.

14

Rudolf Cesaretti et al, conducted an analysis of historical urban scaling trends circa 1300CE in Western Europe, focusing on agglomeration patterns within medieval settlements. They examined settlements in urban systems across Western Europe, with groupings based on regionally distinct political structures, economic focuses, and spatial constraints --- including the aristocratically controlled city-state of Parma in northern Italy, merchant controlled city-states like Goerlitz in Germany, the wool-trading centers of Lincoln and Canterbury in England, and prime trade fair towns like Troyes in France. A prevalent trend emerged: as a city's total settled area increased, so did population density in its core urban areas. This finding implies that \_\_\_\_\_

Which choice most logically completes the text?

- A) even when they were substantial, known inter-regional differences in characteristics of urban systems had a limited effect on agglomeration patterns in medieval Western European settlements.
- B) the observed relationship is heavily influenced by urban characteristics that were particular to medieval Western Europe, making it unlikely that a similarly strong relationship between area and population density would be found for medieval settlements in other regions.
- C) the effects of variations in political and economic interests on agglomeration patterns were less evident in comparisons between medieval settlements within a region than in comparisons between groups of settlements across regions of Western Europe.
- D) despite regional differences in their political and economic systems, medieval Western European settlements shared common spatial constraints that encouraged high population density in core urban areas.

15

After much debate, \_\_\_\_\_ finally made a decision: the judges for the 1947 Nobel Prize in Literature would award André Paul Guillaume Gide of France with that year's prize "for his comprehensive and artistically significant writings, in which human problems and conditions have been presented with a fearless love of truth and keen psychological insight."

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

- A) anyone
- B) you
- C) they
- D) it

16

In June of 1966, the song "I Need Love" was a top-ten hit. Having climbed the charts for six weeks, \_\_\_\_\_ ranked No. 4 on the Billboard Hot 100 list of most popular songs.

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

- A) those
- B) they
- C) each
- D) it

17

In 1847, the novel Agnes Grey was published under the pen name Acton Bell. Now, we know that \_\_\_\_\_

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

- A) was the author's real name Anne Bronte?
- B) the author's real name was Anne Bronte.
- C) was the author's real name Anne Bronté
- D) the author's real name was Anne Bronte?

18

While the greater adjutant (*Leptoptilos dubius*) can be found in places like the Inner Gulf of Thailand and Manchar lake in \_\_\_\_\_ than 80 percent of this endangered stork species is found in Assam, India. There, wildlife biologist Dr. Purnima Devi Barman is on the front lines of conservation efforts to bring adjutants back from near extinction.

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

- A) Pakistan, more
- B) Pakistan; more
- C) Pakistan. More
- D) Pakistan more

19

Canada and Germany have two of the longest constitutions in the world. At 19,565 and 27,379 words, respectively, these \_\_\_\_\_ according to research by constitutional scholars George Tsebelis and Dominic J. Nardi, correlate with GDPs (gross domestic products) that are lower than those of countries with shorter constitutions.

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

- A) constitutions' length,
- B) constitutions lengths,
- C) constitution's length,
- D) constitutions' lengths,

20

A pet cat poses next to its owners in Kiesler and Wife, an oil painting by American \_\_\_\_ Will Barnet.

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

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

21

Every US state has an associated state soil, which is typically selected by a group of experts, then passed through the state legislature to receive its official designation. For example, Arkansas's Stuttgart soil was formally designated in 1997, and Maine's CheSuncook soil in 1999. \_\_\_\_ years pass between a soil's selection and official designation, as the legislative process can be notoriously slow.

Which choice completes the text with the most logical transition?

- A) often,
- B) Therefore,
- C) Similarly,
- D) Indeed,

22

A 1990 study of schooling fish observed the fish mimicking the behavior of school-mates rapidly swimming away from a predator. This is an example of an information cascade that benefits the collective. \_\_\_\_ the animal world is at times susceptible to the spread of misinformation, often with unfavorable results: a 2010 study of semipalmated sandpipers concluded that fleeing in response to flock-mates' false alarms caused the birds to abandon safe nesting grounds unnecessarily.

Which choice completes the text with the most logical transition?

- A) In other words,
- B) Conversely,
- C) Indeed,
- D) Consequently,

23

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

- Bread is a 1968 black-and-white linocut print by Black American artist Elizabeth Catlett.
- It features a young girl eating a slice of bread.
- Relief printing is a technique in which an image is first carved onto a printing block made of wood, rubber, or other materials.
- The block is then painted and stamped onto a print surface.
- Lino cutting is a type of relief printing that uses linoleum tile as the printing block.

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

- A) Relief printing is a technique that can use wood, rubber and other materials as the printing block, not just linoleum tile.
- B) Catlett used a relief printing technique called lino cutting, carving an image onto linoleum tile
- C) Catlett used relief printing to create the 1968 linocut Bread.
- D) In relief printing, an image is carved onto a printing block, which is then painted and pressed onto a print surface

24

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

- Usually, a country's capital is also its largest city by population.
- The capital of the Philippines is Manila.
- Its largest city by population is Quezon City.
- The capital of Liechtenstein is Vaduz.
- Its largest city by population is Schaan.

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

- A) In both the Philippines and Liechtenstein, the capital is not the country's most populous city.
- B) While the most populous city in the Philippines is Quezon city, the most populous city in Liechtenstein is Schaan.
- C) The most populous city in the Philippines is Quezon City, but the country's capital is Manila.
- D) The capital of the Philippines is Manila; the capital of Liechtenstein is Vaduz.

25

- Historian Isabel Wilkerson's book The Warmth of Other Suns is about the Great Migration.
- The Great Migration was a period in twentieth-century US history when over six million African Americans moved from the rural South to cities such as Detroit, Michigan.
- To document this period, Wilkerson narrates the personal journeys of George Swanson Starling and Robert Pershing Foster, among others.
- The book won the Mark Lynton History Prize in 2011.
- It also won the National Book Critics Circle Award in 2011.

Which choice most effectively uses information from the given sentences to emphasize how Wilkerson documents the Great Migration?

- A) Detroit, Michigan, is one of the cities whose African American populations grew during the Great Migration.
- B) Isabel Wilkerson chronicles the complex history of the Great Migration in such riveting, personal detail by narrating the journeys of individuals, such as George Swanson Starling and Robert Pershing Foster.
- C) In 2011, Isabel Wilkerson's book The Warth of other Suns won not only the Mark Lynton History Prize but also the National Book Critics Circle Award
- D) The personal journey of George Swanson Starling is featured in the award winning book The Warmth of Other Suns.

26

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

- India Arie is an African American singer and songwriter.
- The media outlet BBC Music has described her music as a "blend of hip hop, soul and folk [that is] as subtle as it [is] inspired."
- Her acclaimed albums feature many talented musicians.
- Judeth Insel played viola on her first studio album, Acoustic Soul (2001).
- David Davidson played violin on her second studio album, Voyage to India (2002)

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

- A) Judeth Insel played on India Arie's first studio album, Acoustic Soul, which was released one year before her album Voyage to India.
- B) Acoustic Soul and Voyage to India, released in 2001 and 2002, respectively, are albums by singer and songwriter India Arie.
- C) Although both musicians have played on India Arie albums, Judeth Insel played viola, whereas David Davidson played violin.
- D) Judeth Insel and David Davidson both lent their musical talents to albums by India Arie in the early 2000s.

27

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

- Merle Oberon (1911-1979) was an actress born in Mumbai (then known as Bombay), India.
- She was of Indian, Maori, and Irish heritage.
- She was the first Indian-born actress to be nominated for an Academy Award.
- Early in her career, she played many nameless, uncredited roles, such as her role in Alf's Button (1930).
- Later, she played many named, credited roles, such as Marjorie Ismay in Forever and a Day (1943).

The student wants to make and support a generalization about Merle Oberon's early career. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- A) Alf's Button (1930) was released early in Merle Oberon's career, whereas Forever and a Day (1943) came out later.
- B) Merle Oberon wasn't even listed in the credits of some of her early films, such as Alf's Button (1930), where she played a nameless, uncredited role.
- C) Alf's Button and Forever and a Day are both films that include Merle Oberon. The first Indian-born actress to be nominated for an Academy Award
- D) In Alf's Button (1930), actress Merle Oberon played a nameless, uncredited role.

## Reading and Writing Module 2

27 QUESTIONS

Despite stated claims of global relevance, much major research on income inequality performed in the 2010s suffered from a myopic focus on a few countries in North America and Western Europe, partly due to limited data availability. Researchers would later \_\_\_\_\_ this shortcoming after gaining new access to administrative records located in nations in South America, such as Brazil and Eastern Europe, such as Russia.

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

- A) validate
- B) mitigate
- C) categorize
- D) presuppose

2

Though the thermoregulation mechanisms of fungi, such as *Amanita brunnescens*, have received little formal study, anecdotal evidence has suggested that fungal surface temperatures tend to be cooler than ambient temperatures. Experimental findings by Radamés Cordero et al. now \_\_\_\_\_ this idea: colonies of various fungi maintained temperatures below those at which they were incubated in a lab.

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

- A) obscure
- B) corroborate
- C) encapsulate
- D) curtail

3

Andrei Tarkovsky's *Solaris* has the measured pace typical of slow-cinema films. Thai slow-cinema director Apichatpong Weerasethakul (*Uncle Boonmee Who Can Recall His Past Lives*) even states that his own work induces sleep in audiences. This might suggest his films are boring, but boredom does not always cause sleep: boredom creates an anxious tension in the absence of a place to fix attention, and thus induces not somnolence but \_\_\_\_\_.

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

- A) fortitude
- B) perturbation
- C) nonchalance
- D) indolence

4

Difficulties of documenting nocturnal pollinator visits and a general focus on diurnal invertebrate pollinators, such as *Volrcella bombylans*, have resulted in \_\_\_\_\_ of information on nocturnal moth pollination of plants such as *Rubus fuitcosus* L. aggregate, but Max Anderson et al. have addressed this by utilizing infrared technology.

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

- A) an abatement
- B) an aggregation
- C) a dearth
- D) a dissonance

5

Vertical gene transfer involves the transmission of genetic material from a parent to offspring; horizontal gene transfer, on the other hand, involves the exchange of genetic material between organisms not in a parent-offspring relationship. While horizontal gene transfer is common among prokaryotes --- single-celled organisms such as the bacteria *Carnobacterium viridans* and *Massilia timonae* --- it has rarely been observed among eukaryotes (typically multicellular organisms). However, new studies suggest that horizontal gene transfer is more common in eukaryotes than originally thought.

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

- A) It implies that a common perception of horizontal gene transfer may be inaccurate
- B) It compares the frequencies with which horizontal gene transfer has been detected in two categories of organisms.
- C) It argues that a particular direction of research concerning horizontal gene transfer is likely to be fruitless
- D) It indicates a distinction between horizontal gene transfer and vertical gene transfer

6

*The Hundred Days*, first published in 1998, is a novel in Patrick O'Brian's Aubrey/Maturin series, which includes twenty completed books, some critics have found fault with the abrupt endings of *The Hundred Days* and other books in the series, saying that they do not finish conclusively but arbitrarily stop. But other critics argue that the books should not be thought of as discrete texts with traditional beginnings and endings but as a single incredibly long work, similar to other multivolume stories, such as Marcel Proust's *In Search of Lost Time*.

Which choice best states the main purpose of the text?

- A) To present a reason the unusual structure that O'Brian uses for *The Hundred Days* makes it one of his most complex books
- B) To argue that the Aubrey/Maturin series should have the literary renown of *In Search of Lost Time*
- C) To describe a characteristic of the Aubrey/Maturin novels and offer two differing viewpoints on this characteristic
- D) To explain why many critics find the Aubrey/Maturin novels to be remarkably entertaining despite flaws in the novels' structures

7

With its combination of country and pop influences, "Here You Come Again" is typical of Dolly Parton's recordings in the late 1970s and first half of the 1980s. Through songs bridging these two genres, she achieved her greatest commercial successes. A decade earlier, however, Dolly had first established herself as a songwriter steeped in the traditional folk music of the Blue Ridge Mountains, where she was born and raised. The influence of the ballads of this region can be heard in the word choice and subject matter of the lyrics to "Jolene," one of her best songs from this period.

Which choice best describes the overall structure of the text?

- A) It explores Dolly's lifelong interest in folk music, then debates whether pop music influenced "Jolene."
- B) It discusses a particular period in Dolly's recording career, then considers the music in an earlier period of her career,
- C) It enthusiastically recommends Dolly's earliest recordings, then expresses disappointment with her later recordings.
- D) It praises "Here You Come Again," then notes how remarkably similar that song is to a song that Dolly recorded earlier in her career.

8

Studies contributing to the body of evidence that people generally enjoy socializing have routinely focused on interactions in ongoing relationships (from spouses to classmates), but psychologist Selin Salman-Engin and colleagues have demonstrated the benefit of making connections with strangers. Greater positive affect was reported by participants in their study who warmly thanked a shuttle driver than by those who didn't speak to the driver.

#### Text 2

Social relations research commonly draws on a model that centers an individual within three concentric circles. The innermost circle holds one's strongest ties (e.g., a treasured friend), the next holds close but less important ties (e.g., a teammate), and the outermost holds weak ties (those more distant but important enough to be counted as part of one's social network).

Based on the texts, what would Salman-Engin and colleagues (Text 1) most likely say about the discussion of the model in Text 2?

- A) It underscores that most research on social interactions fails to capture a category of connection that has the capacity to contribute positively to individuals' sense of well-being.
- B) It reflects an overemphasis on relationship longevity in researchers' evaluations of the relative importance of various connections in an individual's social network.
- C) It explains researchers' observations that individuals typically expect interactions with familiar people to be more positive than their interactions with unfamiliar people would be.
- D) It emphasizes distinctions among types of close connections that aren't adequately represented in social relations research, since most studies categorize relationships as either close or casual.

9

#### Text 1

From the extinct greater Haitian ground sloth to the living Hoffmann's two-toed sloth, sloths are among the most appealing animals native to the Americas. But scientists still have a lot to learn about them. Unlike their ancient ground-dwelling relatives, today's sloths spend most of their time high up in trees. The sloths' inaccessibility has made it hard for scientists to study them.

#### Text 2

By using a hat-like monitor, biologist Bryson Voirin and colleagues can at last discover the previously hidden activities of sloths. Such monitors can provide information to correct misconceptions. It was long believed that sloths sleep all day. But, in fact, in the wild sloths sleep about nine hours a day.

The author of Text 1 and the author of Text 2 both discuss which topic?

- A) How extinct sloths compare with living sloths
- B) Scientists' efforts to understand sloths
- C) The benefits of putting monitoring devices on sloths
- D) Changes in sloths' habitats

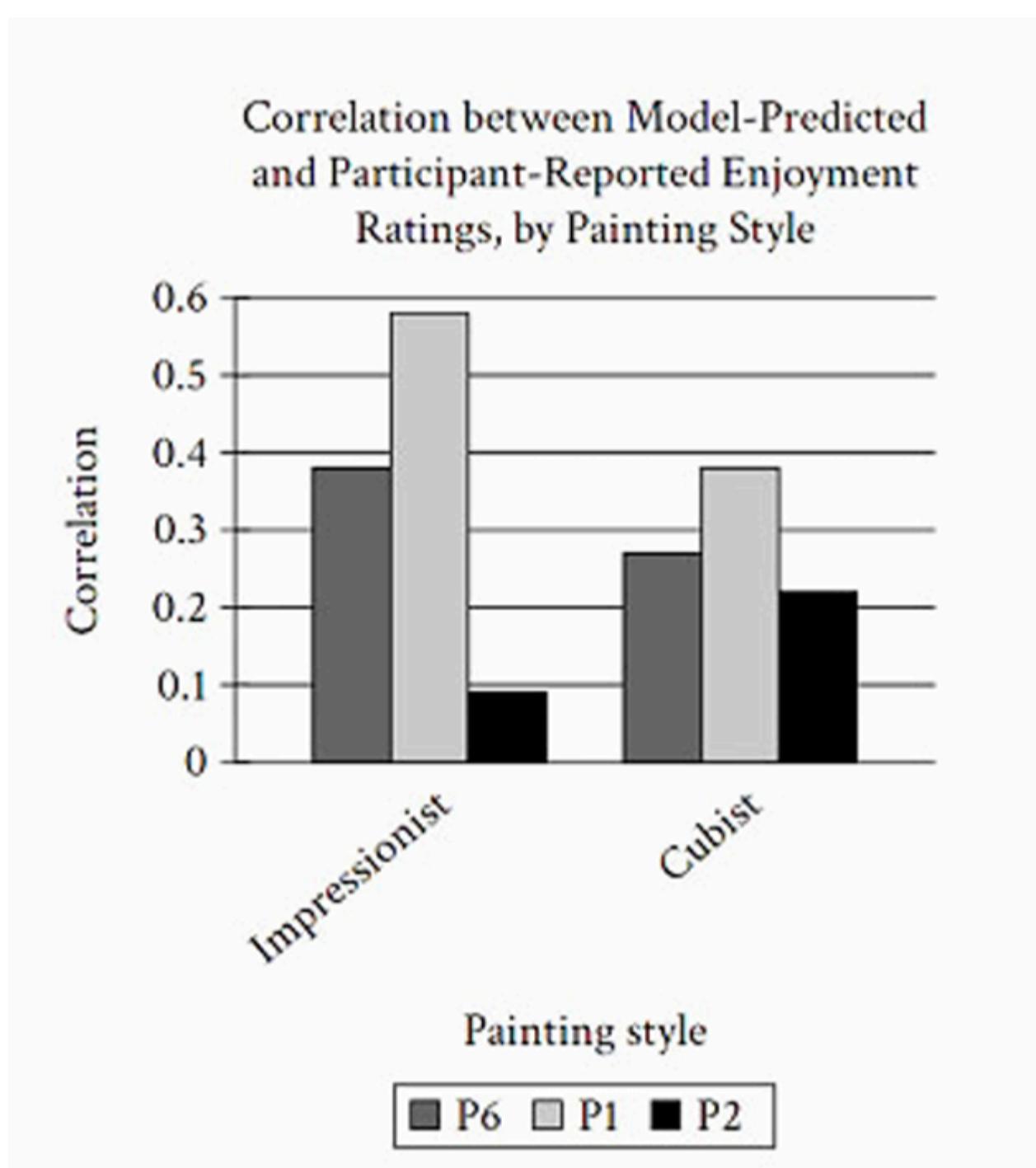
10

Baleen whales eat up to 30 percent of their total body mass in krill (tiny shrimplike creatures) per day. So in one day, a pygmy right whale weighing 3,500 kg could eat 1,050 kg, while a bowhead whale weighing 66,000 kg could ingest a whopping 19,800 kg. Over the last century, baleen whale populations have declined, and contrary to some scientists' expectations, so have krill populations. Matthew S. Savoca and colleagues resolve this apparent discrepancy by pointing out that baleen whales cycle iron in the ocean, helping support phytoplankton populations, which, in turn, sustain krill populations.

Based on the text, what can most reasonably be concluded about pygmy right and bowhead whales?

- A) As krill consumption by pygmy right whales has decreased, the krill consumption of bowhead whales has increased.
- B) The bowhead whale is able to eat more krill per day than the pygmy right whale is
- C) Both pygmy right and bowhead whales can eat krill, but of the two only the pygmy right whale can also subsist on phytoplankton.
- D) Populations of both pygmy right and bowhead whales have declined significantly over the last century due to decreasing levels of iron in the ocean.

11



Neuroscientist Kiyohito ligaya and colleagues developed a computational model to predict how much a person will enjoy a particular work of art on a scale from 1 (not at all) to 4 (very much) and then recruited participants to use the same scale to rate several sets of paintings in various styles. The team calculated the correlation between the ratings predicted by the model and those reported by the participants, with higher correlations indicating that predicted ratings were closer to reported ratings. Assuming participants P1 and P2 gave equal ratings to the impressionist paintings, the graph indicates that the model predicted \_\_\_\_\_

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

- A) P1's and P2's ratings for impressionist paintings would equal one another.
- B) P1's and P2's ratings for impressionist paintings would differ from one another.
- C) P1 would derive more aesthetic pleasure from impressionist paintings than from cubist paintings.
- D) P1 would derive less aesthetic pleasure from impressionist paintings than from cubist paintings

12

Uncle Vanya: Scenes from County Life in Four Acts is an 1898 play by Anton Chekhov, originally written in Russian. In the play, Professor Serebrakoff and his wife Helena have come to stay at their country estate, which Vanya manages with the help of Sonia, the professor's daughter from a previous marriage. Chekhov

portrays the relationship between Vanya and Professor Serebrakoff as being much more strained than it once was.as is evident when \_\_\_\_\_

Which quotation from a translation of Uncle Vanya most effectively illustrates the claim?

- A) Professor Serebrakoff asks Vanya to leave the room, saying, "For the sake of our former friendship do not protest against going, We will talk some other time."
- B) Vanya says to Professor Serebrakof, "For twenty-five years I have managed [the country estate], and have sent you the returns from it like the most honest of servants, and you have never given me one single word of thanks for my work, not one --- neither in my youth nor now."
- C) Vanya says of Professor Serebrakoff, "He is everlastingly whining about his hard lot, though, as a matter of fact, he is extraordinarily lucky."
- D) Professor Serebrakoff says to Helena, "It is funny that everybody listens to[Vanya and his old idiot of a mother, but the moment I open my lips you all begin to feel ill-treated."

13

Some metals contain tungsten carbide nanoparticles (WC-NPs), which can leach into waterways and soils via wastewater. In a 2018 study, Mikael T. Ekvall and colleagues found that WC-NPs can accumulate in the bodies of water lice (*Asellus aquaticus*). While bioaccumulation of manufactured nanoparticles may be inherently worrisome, it has been hypothesized that WC-NP bioaccumulation in invertebrates like *A. aquaticus* could serve a valuable proxy role, obviating the need for manufacturers to conduct costly and intrusive sampling of vertebrate species --- such as Perez's frogs (*Pelophylax perezi*), commonly used in regulatory compliance testing --- for nanoparticle bioaccumulation, as environmental protection laws currently require.

Which finding, if true, would most directly weaken the hypothesis presented in the text?

- A) Compared with *P. perezi*, *A. aquaticus* can accumulate detectable WC-NP concentrations with significantly fewer negative effects.
- B) The rate of WC-Np uptake in *A. aquaticus* differs from the rate of WC-Np uptake in *P. perezi* in a way that is not yet well understood by researchers.
- C) *A. aquaticus* has been shown to accumulate several other types of manufactured nanoparticles in addition to WC NPs, whereas *P.perezi* has been shown to accumulate only WC-NPs.
- D) When *A. aquaticus* and *P. perezi* are exposed to similar levels of WC-NPs, concentrations of WC-NPs in animals of both species show little variation from individual to individual.

14

Veronica I. Bura, Akito Y. Kawahara, and Jayne E. Yack investigated the function of sound production in silk moth and hawk moth caterpillars. They found that during harmless simulated attacks, 3396 of the tested species produced sound, which included four distinct types: chirps, whistles, vocalizations, and clicks. in addition, *Antheraea polyphemus* and *Antheraea polyphemus oculata* released a chemical while or after producing the first sound. These species exclusively produced clicks and chirps, which tend to be shorter in duration than whistles and vocalizations. Bura and colleagues argue that clicks and chirps in species that use chemical defenses are primarily a means of warning (i.e., "educating") predators rather than frightening or startling them.

Which finding, if true, would most directly support Bura and colleagues' claim?

- A) Short-duration sounds like clicks and chirps tend to be especially effective in training animals to associate a behavior with a consequence.
- B) Caterpillars that use chemical defenses produced sounds at a higher volume than did caterpillars without chemical defenses.
- C) The acoustic characteristics of clicks and chirps make them particularly audible to bats, lizards, and birds, some of the most frequent predators of caterpillars.

D) Chickens and yellow warblers, two predators of caterpillars, have been observed to stop their attacks in response to caterpillar sounds of any duration.

15

The compositional strategy of Untitled, a 1955 work by Cherokee artist Edna Massey, is far more closely aligned with Abstract Expressionism --- a mid-twentieth-century school of painting dominated by European American artists---than with traditionally abstract forms of indigenous art, such as beadwork. Few viewers would infer from the stylistic attributes of Untitled that Massey was Indigenous. In this respect, the work typifies Indigenous painters' forays into abstraction during the period. In contrast, the contemporary Caddo artist Chad "Nish" Earles assembles abstract compositions out of motifs common in the traditional ceramics and graphic art of his tribe. Thus in Earles's work, abstraction has the effect of \_\_\_\_\_

Which choice most logically completes the text?

- A) rendering Indigenous identity more legible than it is in Untitled.
- B) asserting the indigenous origins of motifs associated with Abstract Expressionism.
- C) challenging the dominance of European American artists within Abstract Expressionism.
- D) reconciling Indigenous and European American influences that coexist uneasily in Untitled.

16

Archaeologists assume that when a major demographic shift interrupts the intergenerational transmission of expertise, this manifests in the archaeological record in the form of simultaneous reductions in the complexity of multiple specialized crafting traditions. Inventories of excavation sites from the Alazani River valley and nearby areas dating from 4000 to 500 BCE show a steep drop occurring around 1500 BCE in the number of objects featuring gold filigree, an advanced technique in which fine threads of gold are arranged in intricate patterns. The inventories also indicate that advanced copper-alloy metallurgy and most other specialized crafting traditions continued to flourish during this period, a finding suggesting that \_\_\_\_\_

Which choice most logically completes the text?

- A) disruptions around 1500 BCE in the utilization of gold filigree likely occurred in the context of demographic continuity among peoples of the Alazani River valley.
- B) a sudden simultaneous decline in artifacts from multiple specialized crafting traditions is less likely than previously assumed to indicate that the transmission of expertise was disrupted by demographic changes.
- C) peoples in the Alazani River valley continued to uphold multiple specialized crafting traditions, including goldsmithing and copper-alloy metallurgy, even as demographic shifts occurred.
- D) cross-cultural transmission between distinct demographic groups in the Alazani River valley likely explains the expansion of copper-alloy metallurgy beginning around 1500 BCE.

17

In a list titled "Elegant Things" from Sei Shonagon's pillow Book, the author delights in a violet waistcoat, wisteria blossoms, and a child eating strawberries. Such lists, observed sharply yet simply by Shonagon, who served as a lady-in-waiting to Empress Teishi in the tenth century, \_\_\_\_\_ the daily minutiae of Japanese courtly life.

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

- A) reveals
- B) was revealing
- C) to reveal
- D) reveal

18

Citing the example of Zeus, a mythological god whose tomb was reportedly located on the island of Crete, the writer Euhemerus (fourth century BCE) theorized that all the deities in the Greek pantheon --- including the god of knowledge and the arts, Apollo; the god of wine and the theater, Dionysus; and the god of constellations, \_\_\_\_\_ may have been historical figures who, through the power of myth, underwent apotheosis.

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

- A) Crius;
- B) Crius ---
- C) Crius,
- D) Crius

19

Categorized as a dactyl, the word "gradient" consists of one stressed syllable followed by two unstressed syllables. The word "harpist," by comparison, consists of one stressed syllable followed by one unstressed syllable, a metrical foot \_\_\_\_\_ to in English metrical verse as a trochee.

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

- A) referred
- B) is referred
- C) referring
- D) refers

20

The parks of Chicago, Illinois, seem to be making people happier. In a 2022 study, researchers studying connections between the physical location in which a social media post was \_\_\_\_\_ analyzed geotagged social media posts from various locations in Chicago. They found that posts from the city's parks contained more words associated with happiness than other posts did.

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

- A) created and the post's content
- B) created, and the post's content
- C) created and the post's content,
- D) created, and the post's content,

21

With an installed capacity of 35 megawatts, the Platanares geothermal power plant in Honduras offers a dependable source of renewable energy. Power plants like Platanares supply only a small fraction of Honduras's \_\_\_\_\_ the scarcity of sites with the necessary combination of high-temperature geothermal reservoirs and fractured rock limiting the widespread development of such systems.

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

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

22

The album Irreversible....2012 by La Arrolladora Banda El Limón De René Camacho received much critical attention and praise for its contribution to the banda genre, a form of regional Mexican music featuring large ensembles of wind instruments and drums that first developed in southern and central Mexico in the mid-nineteenth century. \_\_\_\_\_ few were surprised when the album won the Best Banda Album award at the 2012 Latin Grammys.

Which choice completes the text with the most logical transition?

- A) Often,
- B) Therefore,
- C) Nevertheless,
- D) Granted,

23

In 1920, the US Geological Survey determined the geographic center of Rhode Island using only a cardboard cutout of the state and a piece of string. \_\_\_\_\_ this apparently crude technique yielded a relatively close approximation: when the 1920 center was compared to a center determined by a computer program nearly a hundred years later, the two diverged by just a few miles.

Which choice completes the text with the most logical transition?

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

24

In an ekphrastic poem, a poet explores a work of visual art, such as a drawing, sculpture, or painting. Elizabeth Alexander's 2011 poem "Walking," for example, meditates on Charles Alston's 1963 painting Walking; Cornelius Eady's 2001 poem "Jacob Lawrence: Summer Street Scene." \_\_\_\_\_ takes a painting as its subject: Jacob Lawrence's 1948 work Summer Street Scene in Harlem.

Which choice completes the text with the most logical transition?

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

25

- Cinematographers work with cameras and lighting.
- They help translate directors' ideas into visual images.
- *Frida* (2002) was directed by Julie Taymor.
- Rodrigo Prieto was the film's cinematographer.

Which choice most effectively uses information from the given sentences to provide an example of a film Prieto worked on?

- A) Cinematographer Rodrigo Prieto worked with director Julie Taymor.
- B) The 2002 film *Frida* is one example of Rodrigo Prieto's work as a cinematographer.
- C) In filmmaking, directors work with others to translate their ideas into the visual images that we encounter on the screen.

D) As cinematographer, Rodrigo Prieto works with cameras and lighting to translate the film director's ideas into visual images.

26

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

- The Arabic word "dinar" comes from the Latin word "denarius."
- Today, nearly a dozen different national currencies are referred to as "dinars."
- Bahrain's currency is known as the Bahraini dinar.

The student wants to provide an example of a country that uses the word "dinar" in the name of its currency. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- A) The Latin word "denarius" is the origin of the Arabic word "dinar."
- B) Today, several countries use the word "dinar" in naming their currencies.
- C) Bahrain uses the Bahrain dinar as its national currency.
- D) Bahrain does not refer to its currency by the Latin word "denarius."

27

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

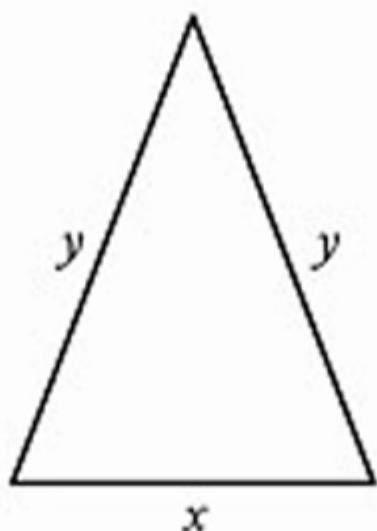
- The ratio of the total mass of an element to the combined mass of all elements in a given environment is called the mass fraction.
- The mass fraction of chromium (Cr) on Earth is 4,700 parts per million (ppm).
- This indicates that the relative abundance of chromium on Earth is 0.47%.
- The ratio of the total number of atoms of an element to the total number of all atoms in a given environment is called the mole fraction.
- The mole fraction of chromium on Earth is 2,300,000 parts per billion (ppb)
- This indicates that the relative abundance of chromium on Earth is 0.23%.

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

- A) On Earth, the mass fraction of chromium is 4,700 ppm, or 0.47%, and the mole fraction is 2,300,000 ppb, or 0.23%.
- B) While mass fraction is a measure of relative mass and mole fraction is a measure of relative atom count, both indicate the relative abundance of elements on Earth.
- C) Both mass and mole fraction express the relative abundance of chromium on Earth as a ratio of the total mass of chromium to the combined mass of all atoms
- D) The mass fraction of chromium indicates its relative mass; in addition, the element's mole fraction indicates the relative number of chromium atoms

## Math Module 1

22 QUESTIONS



Note: Figure not drawn to scale.

The triangle shown has one side with a length of  $x$  inches and two sides each with a length of  $y$  inches. The perimeter of the triangle is 47 inches. Which equation represents this situation?

- A)  $x + y = 47$
- B)  $x + 2y = 47$
- C)  $2x + y = 47$
- D)  $2x + 2y = 47$

2

If  $7 + x = 4$ , what is the value of  $42 + 6x$ ?

3

A batch of smoothies consists of 4 cups of milk and 2 bananas and has 1,228 milligrams(mg) of calcium. There is 304 mg of calcium in 1 cup of milk. How much calcium, in mg, is in 1 banana?

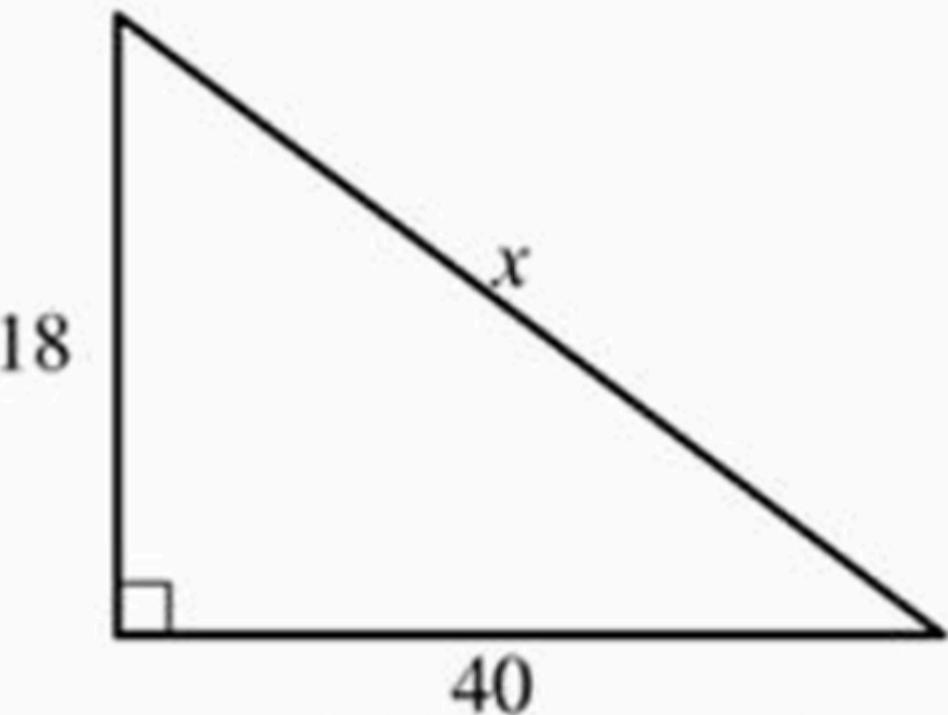
- A) 1,216
- B) 462
- C) 12
- D) 6

4

A furniture company is selling all tables with a 20% discount off their original price for the month of October. What is the discount, in dollars, on a table with an original price of \$130?

- A) 110
- B) 90
- C) 52
- D) 26

5



Note: Figure not drawn to scale.

In the right triangle shown, what is the value of  $x$ ?

- A)  $\sqrt{58}$
- B)  $\sqrt{116}$
- C)  $\sqrt{720}$
- D)  $\sqrt{1924}$

6

$$4x = 16$$

$$-3x + y = -5$$

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

- A) - 21
- B) - 11
- C) 11
- D) 21

7

A shopper is purchasing oranges that cost \$0.67 each. If the shopper has a coupon for \$2 off the entire purchase and there is no sales tax, which inequality represents the number of oranges,  $x$ , that the shopper can purchase for no more than \$12?

- A)  $0.67x + 2 \leq 12$
- B)  $0.67x + 2 \geq 12$
- C)  $0.67x - 2 \leq 12$
- D)  $0.67x - 2 \geq 12$

8

Circle T has a radius of 35 millimeters (mm). What is the area of circle T, in mm<sup>2</sup>?

- A)  $35\pi$
- B)  $70\pi$

C)  $140\pi$

D)  $1,225\pi$

9

In the  $xy$ -plane, circle F is defined by the equation  $(x + 7)^2 + (y + 7)^2 = 36$ . Circle G has the same center as circle F, and the radius of circle G is 2 units greater than the radius of circle F. Circle G is defined by the equation  $(x + 7)^2 + (y + 7)^2 = p$ , where  $p$  is a constant. What is the value of  $p$ ?  
←

10

Which expression is equivalent to  $4yz^3 + 5yz + 3yz^3$ ?  
←

A)  $7yz^3 + 5yz$  ←

B)  $7yz^6 + 5yz$  ←

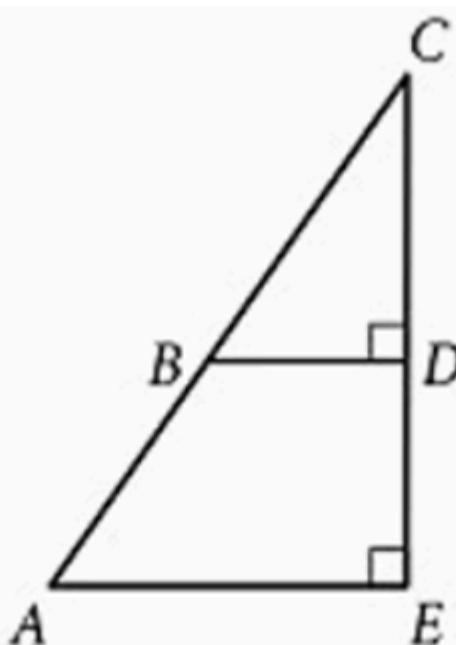
C)  $12yz^6$  ←

D)  $12yz^7$  ←

11

If  $x/y = 76$  and  $cx/4y = 76$ , what is the value of  $c$ ?  
←

12



Note: Figure not drawn to scale.

In the figure shown, triangle CAE is similar to triangle CBD. The measure of angle CBD is  $57^\circ$  and  $AE = 21(BD)$ . What is the measure of angle CAE?

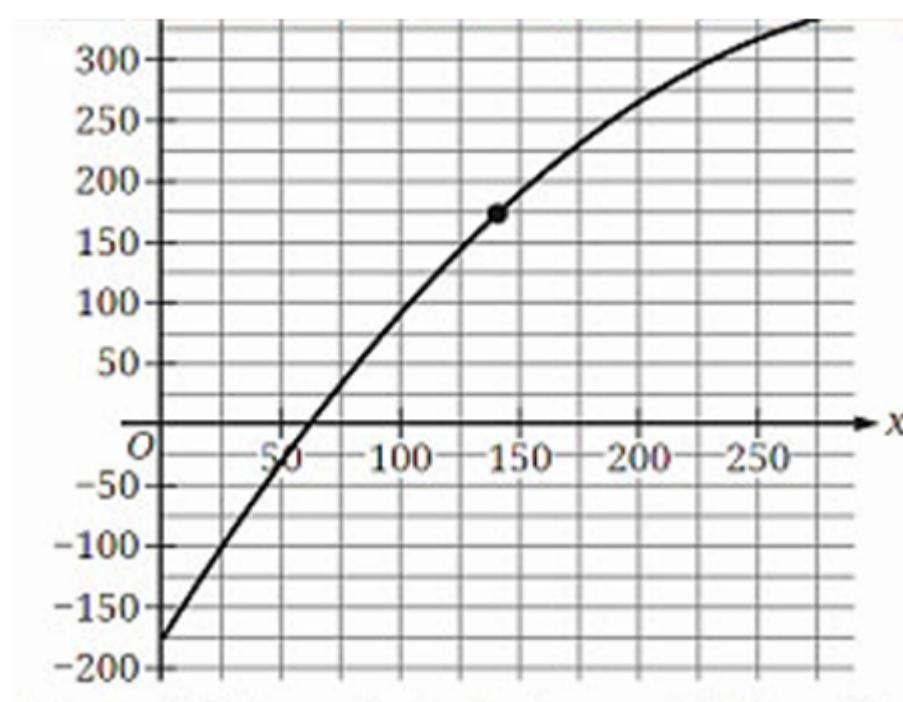
A)  $(21 \cdot 57)^\circ$

B)  $(21 + 57)^\circ$

C)  $57^\circ$

D)  $21^\circ$

13



The graph shows the estimated boiling point  $y$ , in degrees Celsius, of a straight-chain alkane with a molecular weight of  $x$  grams per mole, where  $1 < x \leq 280$ . Which statement is the best interpretation of the point  $(141.32, 172.26)$ ?

- A) A straight-chain alkane with a molecular weight of 172.26 grams per mole has an estimated boiling point of 141.32 degrees Celsius
- B) A straight-chain alkane with a molecular weight of 141.32 grams per mole has an estimated boiling point of 172.26 degrees Celsius.
- C) The minimum estimated boiling point for straight-chain alkanes corresponds to an alkane with a molecular weight of 141.32 grams per mole and an estimated boiling point of 172.26 degrees Celsius.
- D) The maximum estimated boiling point for straight-chain alkanes corresponds to an alkane with a molecular weight of 141.32 grams per mole and an estimated boiling point of 172.26 degrees Celsius.

14

Tanya drove on the highway and on local roads to complete a trip of 290 miles. The drive took 5 hours. She drove an average speed of 65 miles per hour (mph) on the highway and an average speed of 30 mph on local roads. If  $x$  is the time, in hours, Tanya drove on the highway and  $y$  is the time, in hours, she drove on local roads, which system of equations represents this situation?

- A)  $65x + 30y = 5x + y = 290$
- B)  $65x + 30y = 290x + y = 5$
- C)  $30x + 65y = 5x + y = 290$
- D)  $30x + 65y = 290x + y = 5$

15

If  $72 / x = 6x$ , what is the value of  $6x^2$ ? ↵

↵

- A) 432
- B) 72
- C) 12
- D) 6

16

$$y \leq 5x - 21$$

Which point  $(x, y)$  is a solution to the given inequality in the  $x$ -plane?

- A) (-5, -21)
- B) (0, 21)
- C) (5, -21)
- D) (6, 21)

17

A dance studio charges an introductory fee for the first 3 lessons and then charges a fixed fee for each additional lesson. One student took 6 lessons and was charged \$150. Another student took 17 lessons and was charged \$480. Which function  $f$  gives the total charge, in dollars, for any student who took  $x$  lessons, where  $x > 2$ ?

- A)  $f(x) = 25x$
- B)  $f(x) = 25x + 55$
- C)  $f(x) = 30x$
- D)  $f(x) = 30x - 30$

18

$$f = (10x)^2 / 7g \leftarrow$$

$\leftarrow$

The given equation relates the positive numbers  $f$ ,  $x$ , and  $g$ . Which equation correctly expresses  $x$  in terms of  $f$  and  $g$ ?  $\leftarrow$

- A)  $x = \sqrt{7fg} / 10 \leftarrow$
- B)  $x = 10 \sqrt{7fg} \leftarrow$
- C)  $x = \sqrt{7fg/10} \leftarrow$
- D)  $x = \sqrt{7fg} - 10 \leftarrow$

19

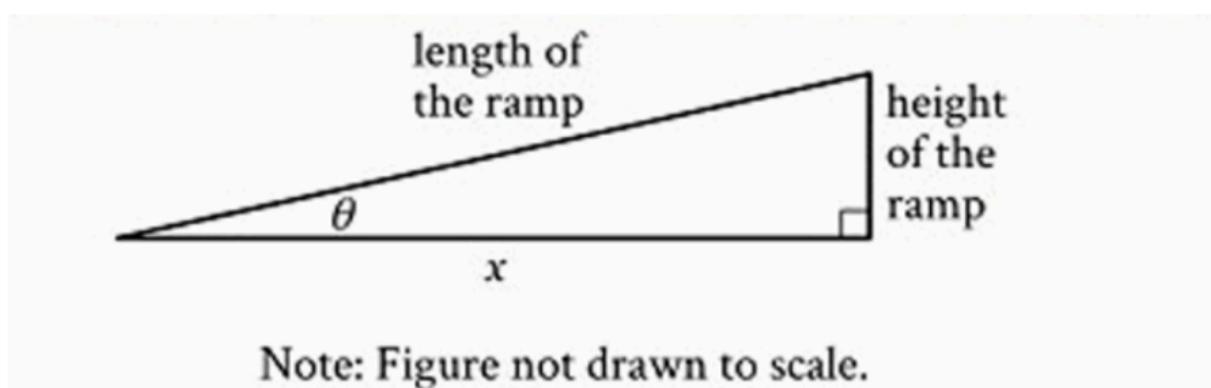
In the  $xy$ -plane, line  $l$  passes through the point  $(0, 0)$  and is parallel to the line represented by the equation  $y = 8x + 4$ . If line  $f$  also passes through the point  $(6, d)$ , what is the value of  $d$ ?

20

A circle in the  $xy$ -plane has its center at  $(14, 19)$  and has a radius of  $7k$ . Which equation represents this circle?

- A)  $(x - 14)^2 + (y - 19)^2 = 49k^2 \leftarrow$
- B)  $(x - 14)^2 + (y - 19)^2 = 49k^2 \leftarrow$
- C)  $(x - 14)^2 + (y - 19)^2 = 7k^2 \leftarrow$
- D)  $(x - 14)^2 + (y - 19)^2 = 7k^2 \leftarrow$

21

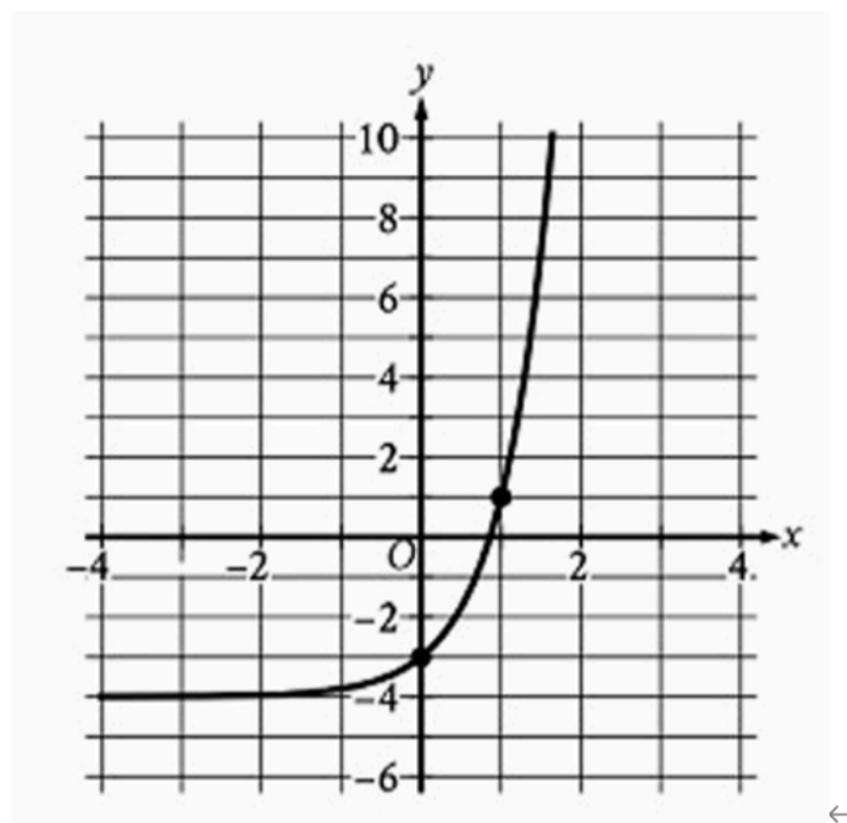


←

According to a US law, ramps for use by the general public must form an angle with level ground such that  $\tan\theta \leq 1/12$ . If the ramp in the figure conforms to this law and has a height of 29.1 inches, what is the least possible value of  $x$ , in inches? ←

←

22



←

The equation of the graph shown is  $y = a^x + b$ , where  $a$  and  $b$  are constants. What is the value of  $a - b$ ? ←

←

## Math Module 2

**22 QUESTIONS**

1

$$f(x) = (x+9)/3$$

For the function  $f$  defined by the equation shown, what is the value of  $f(-6)$ ?

- A) -3
- B) -1
- C) 1
- D) 3

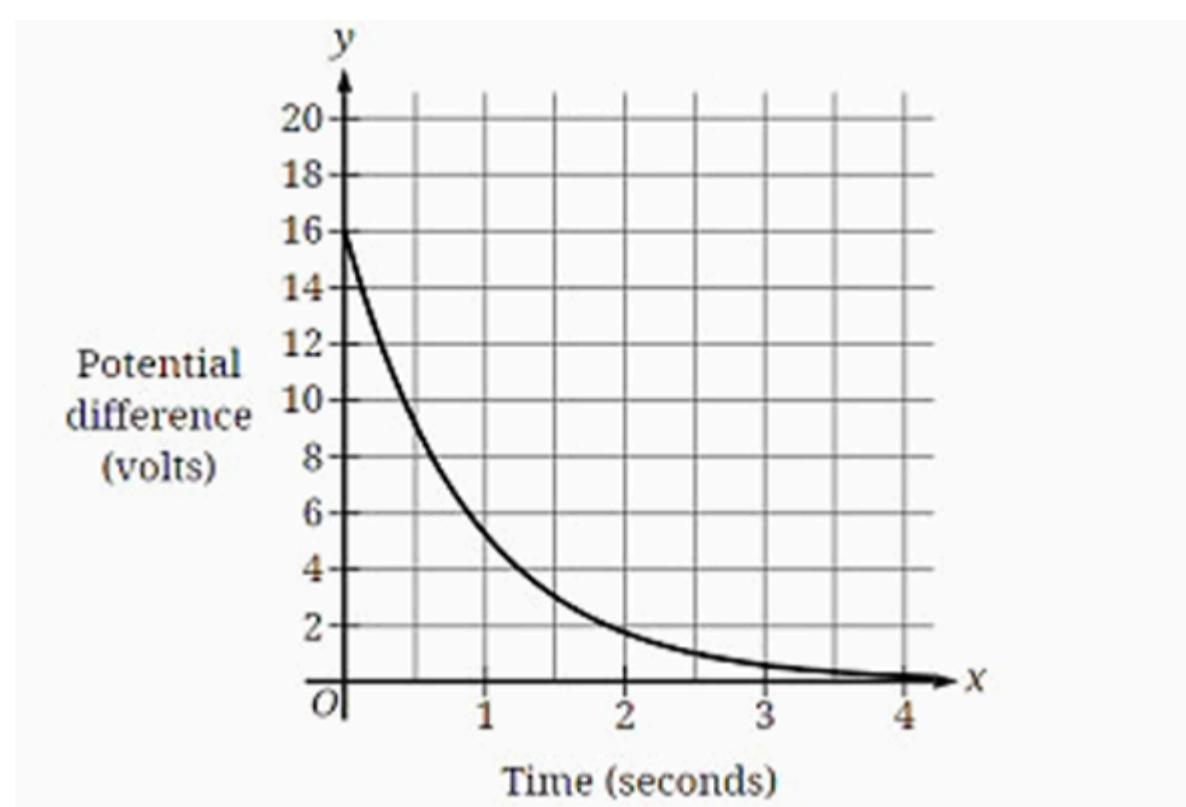
2

28, 29, 30, 32, 33, 37

what is the mean of the data set shown?

- A) 28
- B) 30
- C) 31
- D) 37

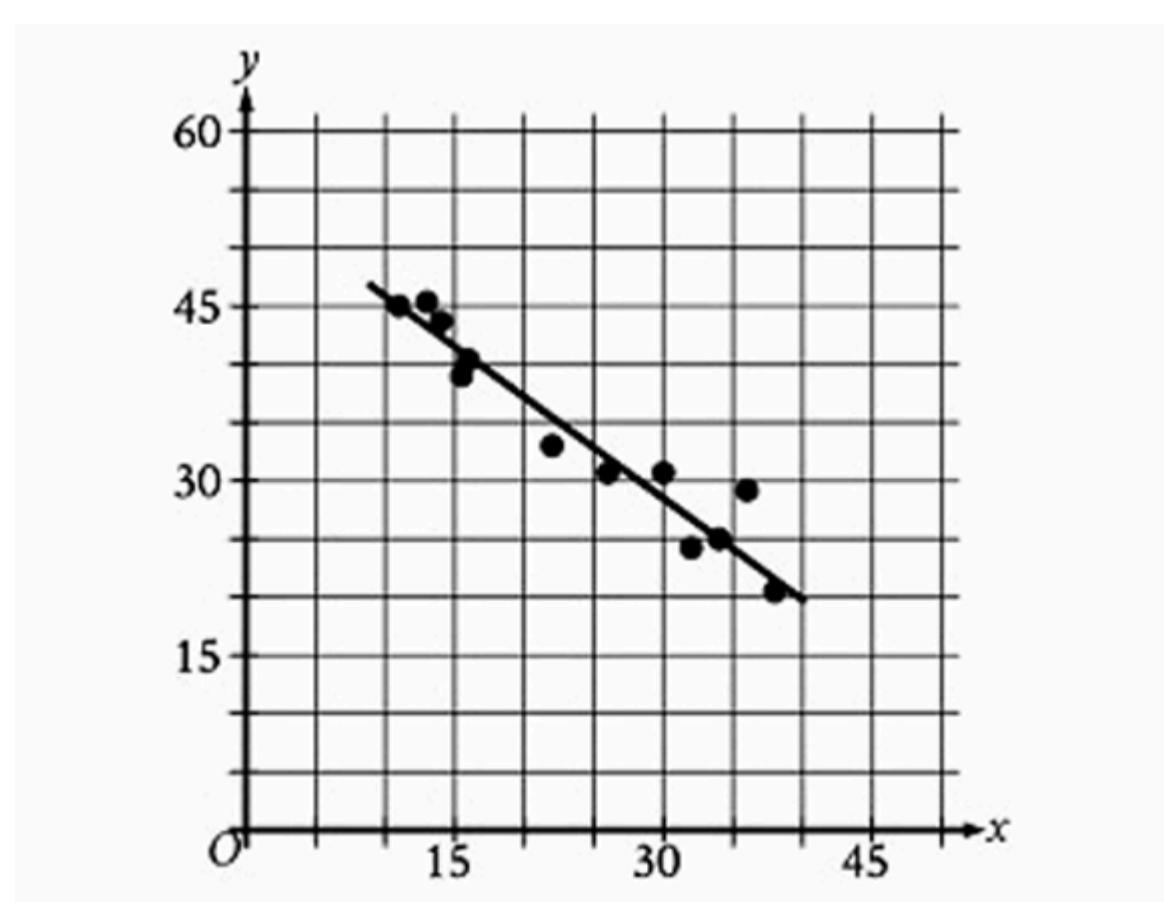
3



The potential difference across a capacitor in an electric circuit is initially 16 volts and decreases with time, as shown in the graph. Which of the following is closest to the time, in seconds, from the initial measurement at which the potential difference across the capacitor is 15% of its initial value?

- A) 0.43
- B) 0.85
- C) 1.71
- D) 3.41

4



The scatterplot shows the relationship between two variables,  $x$  and  $y$ , for data set A. A line of best fit for the data is also shown. Data set B is created by subtracting 9 units from the value of  $y$  for each data point from data set A. Which of the following is closest to the  $y$ -coordinate of the  $y$ -intercept of the line of best fit for data set B?

- A) 45.57
- B) 53
- C) 59.62
- D) 62.75

5

In the linear function  $f$ ,  $f(0) = 5$  and  $f(7) = 5$ . Which equation defines  $f$ ?

- A)  $f(x) = 0$
- B)  $f(x) = 7$
- C)  $f(x) = 5$
- D)  $f(x) = x + 5$

6

$x$	$f(x)$
1	-20
5	-40
10	-65

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

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

7

A sample of a certain isotope takes 29 years to decay to half its original mass. The function  $s(t) = 128(0.5)^{t/29}$  gives the approximate mass of this isotope, in grams, that remains  $t$  years after a 128-gram sample starts to decay. Which statement is the best interpretation of  $s(58) = 32$  in this context? ↵

- A) Approximately 32 grams of the sample remains 58 years after the sample starts to decay.
- B) The mass of the sample has decreased by approximately 32 grams 58 years after the sample starts to decay.
- C) The mass of the sample has decreased by approximately 58 grams 32 years after the sample starts to decay.

D) Approximately 58 grams of the sample remains 32 years after the sample starts to decay.

8

Age group	Proportion
Less than 18 years old	34%
18–40 years old	23%
41–65 years old	22%
Greater than 65 years old	21%

The table shows the distribution of people in a certain city by age group. If a person in this city is selected at random, which of the following is closest to the probability of selecting a person who is greater than 65 years old, given that the person is at least 18 years old?

- A) 0.21
- B) 0.32
- C) 0.45
- D) 0.62

9

A right circular cone has a base diameter of 28 inches and a height of 6 inches. The volume of this cone is  $k\pi$  cubic inches. what is the value of k?

10

In triangle ABC, point D is the midpoint of segment AB and point E is the midpoint of segment BC. If  $BD = 8$  and  $DE = 14$ , what is the length of segment AC?

- A) 28
- B) 26
- C) 22
- D) 16

11

$$x(r-7) + 3 = 19x + 25$$

In the given equation, r is a positive integer. If the given equation has exactly one solution, what CANNOT be the value of r?

- A) 3
- B) 7
- C) 22
- D) 26

12

In a collection of items, 10% are red, 25% are green, 35% are blue, and 30% are yellow. If there are 40 green items, how many blue items are in the collection?

- A) 14
- B) 16
- C) 48
- D) 56

13

$$x(13x+27) + c = 5 \leftarrow$$

In the given equation,  $c$  is a constant. A solution to the equation is  $(-27 + \sqrt{261}) / 26$ , what is the value of  $c$ ?  $\leftarrow$

- A) 14
- B) 9
- C) 5
- D) 4

14

One of the factors of  $2x^3 + 44x^2 + 234x$  is  $x + b$ , where  $b$  is a positive constant. What is the smallest possible value of  $b$ ?  $\leftarrow$

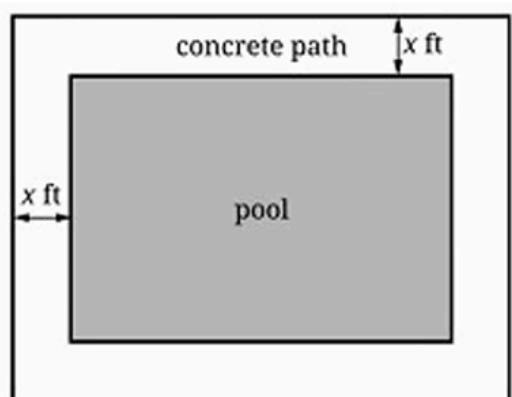
$\leftarrow$

15

A model estimates that at the end of each year from 2015 to 2020, the number of rabbits in a population was 170% more than the number of rabbits in the population at the end of the previous year. The model estimates that at the end of 2016, there were 216 rabbits in the population. Which of the following equations represents this model, where  $n$  is the estimated number of rabbits in the population  $t$  years after the end of 2015 and  $t \leq 5$ ?

- A)  $n = 80(1.7)^t \leftarrow$
- B)  $n = 80(2.7)^t \leftarrow$
- C)  $n = 216(1.7)^t \leftarrow$
- D)  $n = 216(2.7)^t \leftarrow$

16



Note: Figure not drawn to scale.

←

The figure shows a rectangular pool surrounded by a concrete path that is  $x$  feet (ft) wide on all sides. The pool is 21 ft long and 13 ft wide. The area of the concrete path is  $240 \text{ ft}^2$ . What is the value of  $c$ ? ←

- A) 3
- B) 6
- C) 20
- D) 40

17

$x$	$y$
$-2s$	17
$-s$	14
$s$	8

←

The table shows three values of  $x$  and their corresponding values of  $y$ , where  $s$  is a constant. There is a linear relationship between  $x$  and  $y$ . Which of the following equations represents this relationship? ←

←

- A)  $sx + 3y = 11s$
- B)  $3x + sy = 11s$
- C)  $3x + sy = 11$
- D)  $sx + 3y = 11$

18

In a set of four consecutive odd integers, where the integers are ordered from least to greatest, the first integer is represented by  $x$ . The product of 28 and the third odd integer in the set is at most the value of 50 less than the sum of the first and fourth odd integers in the set. What is the greatest possible value of  $x$ ?

19

A square map has a side length of 30 inches, and 1 inch on the map represents an actual distance of 17 miles. A smaller version of the same map is printed as a square with the side length 65% 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) 5.95

- B) 10.30
- C) 19.50
- D) 48.57

20

The functions  $f$  and  $g$  are defined by the equations shown, where  $a$  and  $b$  are integer constants,  $a < b$  and  $b < 0$ . If  $y = f(x)$  and  $y = g(x)$  are graphed in the  $xy$ -plane, which of the following equations displays, as a constant or coefficient, the  $y$ -coordinate of the  $y$ -intercept of the graph of the corresponding function? ↵

- I.  $f(x) = a(2.1)^{x+b}$  ↵
- II.  $g(x) = a(2.1)^x + b$  ↵

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

21

The function  $h$  is defined by  $h(x) = -\sqrt{x^2 + bx + c}$ , where  $b$  and  $c$  are constants. In the  $xy$ -plane, the graph of  $y = h(x)$  contains the points  $(2, 0)$  and  $(0, -\sqrt{358})$ . If  $h(m) = 0$ , what is the greatest possible value of  $m$ ? ↵

↵

22

The function  $f$  is defined by  $f(x) = |x|/a - 14$ , where  $a < 0$ . What is the product of  $f(15a)$  and  $f(8a)$ ? ↵

## Reading and Writing Module 1 Answers

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

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

## Reading and Writing Module 2 Answers

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

## Math Module 1 Answers

1. B  
2. 24  
3. D

4. D  
5. D  
6. C  
7. C  
8. D  
9. 64  
10. A  
11. 4  
12. C  
13. B  
14. B  
15. B  
16. C  
17. D  
18. A  
19. 48  
20. B  
21. 349.2  
22. 9

## Math Module 2 Answers

1. C  
2. C  
3. C  
4. A  
5. C  
6. C  
7. A  
8. B  
9. 392  
10. A  
11. D  
12. D  
13. A  
14. 9  
15. B  
16. B  
17. B  
18. -7  
19. D  
20. D  
21. 179  
22. 638