

SAT 2023 Dec Digital "A" Variant

IMPORTANT REMINDERS

1

A No.2 pencil is required for the test.
Do not use mechanical pencil or pen.

2

Sharing any questions with anyone is a violation of
Test Security and Fairness policies and may result in
your scores being canceled.

The National Heritage Fellowship was created to publicly ____ exceptional folk and traditional artists in the United States. In 1995, the fellowship was given to the Navajo (Diné) basket weaver Mary Holiday Black to celebrate her lifetime contributions to the arts.

1

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

- (A) startle
- (B) recognize
- (C) familiarize
- (D) convey

The following text is adapted from Kenneth Grahame's 1908 novel *The Wind in the Willows*. The Mole is dazed after briefly meeting a stranger while traveling with a friend.

[The] Mole stood still a moment, held in thought. As one wakened suddenly from a beautiful dream, who struggles to recall it, and can re-capture nothing but a dim sense of the beauty of it, the beauty! Till that, too, fades away in its turn.

2

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

- (A) Begin
- (B) Remember
- (C) Overlook
- (D) Reject

Text corpora such as the Bank of English are enormous collections of electronically stored texts that can be used for empirical testing of hypotheses regarding how ____ a word is in spoken and written English. For instance, one might have a guess about the incidence of the word "get," but only an analysis of a corpus can prove that "get" is the fifth most commonly used verb.

3

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

- (A) pervasive
- (B) profound
- (C) credible
- (D) assertive

British painter Peter Edwards is known for his portraits of notable figures in different fields, from poet Wendy Cope to mathematician Christopher Zeeman. Widespread admiration of these works has helped Edwards gain substantial _____ as an artist.

4

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

- (A) sympathy
- (B) prestige
- (C) assistance
- (D) tolerance

The Apalachicola River delta system is located in Florida, where the river drains into the Gulf of Mexico, and is shaped by _____ factors: for example, the geography of the coastline influences sedimentary deposition, which over time alters coastal geography.

5

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

- (A) tenuous
- (B) interdependent
- (C) unyielding
- (D) comprehensive

In the late 1800s, Spanish-language newspapers flourished in cities across Texas. San Antonio alone produced eleven newspapers in Spanish between 1890 and 1900. But El Paso surpassed all other cities in the state. This city produced twenty-two newspapers in Spanish during that period. El Paso is located on the border with Mexico and has always had a large population of Spanish speakers. Thus, it is unsurprising that this city became such a rich site for Spanish-language journalism.

6

Which choice best states the main purpose of the text?

- (A) To compare Spanish-language newspapers published in Texas today with ones published there during the late 1800s
- (B) To explain that Spanish-language newspapers thrived in Texas and especially in El Paso during the late 1800s
- (C) To argue that Spanish-language newspapers published in El Paso influenced the ones published in San Antonio during the late 1800s
- (D) To explain why Spanish-language newspapers published in Texas were so popular in Mexico during the late 1800s

In Hoocák, an Indigenous language from the Midwest region of what is now the United States, *paras* means “flat,” whereas *paraparač* means “square.” This phenomenon, in which an element of a root word is repeated, sometimes with modification, within another word that is related to the root word, is called reduplication. In this case, the element “para” in *paras* gets repeated in *paraparač*. There are many examples of this type of reduplication in Hoocák.

7

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

- (A) It emphasizes how frequently reduplication occurs in Hoocák.
- (B) It acknowledges that Hoocák has some important exceptions to the general pattern described earlier.
- (C) It elaborates on the discussion of reduplication by explaining how it works in the specific Hoocák words introduced earlier.
- (D) It provides English translations of the Hoocák words mentioned earlier.

In a study by Mika R. Moran, Daniel A. Rodriguez, and colleagues, residents of Mexico City, Mexico, and Buenos Aires, Argentina, were surveyed about parks in their cities. Of the 562 respondents from Mexico City, 77.6% indicated that they use the city's parks, and of the 683 respondents from Buenos Aires, 69.9% indicated using city parks. Given that the percentage of Mexico City respondents who reported living within a 10-minute walk of a park was much lower than that reported by Buenos Aires respondents, greater proximity alone can't explain the difference in park use.

8

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

- (A) It marks a shift from a discussion of the researchers' conclusion to a discussion of their methods.
- (B) It identifies the nature of a relationship that is significant to the text's conclusion.
- (C) It provides context to help readers understand the scope of the researchers' survey.
- (D) It introduces a counterexample to the scenario described earlier in the text.

The following text is 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 on a walk in the countryside outside of Paris, France.

I walked slowly beneath the young leaves, drinking in the air, fragrant with the odor of young buds and sap. I sauntered along, forgetful of musty papers, of the offices, of my chief, my colleagues, my documents, and thinking of the good things that were sure to come to me, of all the veiled unknown contained in the future. A thousand recollections of childhood came over me, awakened by these country odors, and I walked along, permeated with the fragrant, living enchantment, the emotional enchantment of the woods warmed by the sun of June.

9

Which choice best states the main idea of the text?

- (A) Having decided to leave his current employment, the narrator is returning to his childhood home in the country.
- (B) The narrator's natural surroundings help him escape his work concerns by prompting hopes about the future and memories of youth.
- (C) The narrator is using the quiet of the countryside to help him think about how projects at work could be advantageous for his career.
- (D) The narrator forgets to address pressing work issues because the smells of the countryside distract him with thoughts of his youth.

Marrakech has high pedestrian traffic, but simply replicating a feature of Marrakech associated with walkability—e.g., its highly varied streetscape—may be insufficient to induce increased walking in other cities. As urbanist Mariela Alfonzo argues, our understanding of individuals' decision-making about whether to walk is insufficiently robust: some studies emphasize the role of demographic characteristics, others the role of public transit availability, and so on, but walking decisions are made in complex contexts in which multiple conditions and needs inform individuals' choices.

10

Based on the text, Alfonzo would most likely agree with which statement about studies of decision-making about walking?

- (A) They would be improved by efforts to identify the features that cities with high pedestrian traffic have in common.
- (B) They are unlikely to find convincing evidence that any single factor consistently predicts walking decisions.
- (C) They have overstated the extent to which people differ in their decision-making processes regarding walking.
- (D) They tend to be misleading because they ignore the most important factor influencing walking decisions.

Total Areas of Five Tribal Nations around the United States

Tribal nation	Location	Area (square miles)
Tohono O'odham Nation	Arizona	4,453
Crow Tribe	Montana	3,606
Leech Lake Band of Ojibwe	Minnesota	1,311
Yakama Nation	Washington	2,188
Muscogee Nation	Oklahoma	4,867

In terms of total area, the Muscogee Nation is one of the largest tribal nations in the United States. It covers 4,867 square miles in what is now eastern Oklahoma. In comparison, the total area of the Leech Lake Band of Ojibwe in Minnesota is only _____.

"Lines Written in Early Spring" is a 1798 poem by William Wordsworth. In the poem, the speaker describes having contradictory feelings while experiencing the sights and sounds of a spring day:

11

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

- (A) 1,311 square miles.
- (B) 2,188 square miles.
- (C) 4,453 square miles.
- (D) 3,606 square miles.

12

Which quotation from "Lines Written in Early Spring" most effectively illustrates the claim?

- (A) "Through primrose-tufts, in that sweet bower, / The periwinkle trail'd its wreathes; /And 'tis my faith that every flower/Enjoys the air it breathes."
- (B) "The budding twigs spread out their fan, /To catch the breezy air; /And I must think, do all I can, / That there was pleasure there."
- (C) "The birds around me hopp'd and play'd: / Their thoughts I cannot measure, / But the least motion which they made, / It seem'd a thrill of pleasure."
- (D) "I heard a thousand blended notes, / While in a grove I [sat] reclined. /In that sweet mood when pleasant thoughts / Bring sad thoughts to the mind."

Dated Ages of Lunar Samples from Select Missions

Mission name	Year	Landing site	Approximate age of lunar samples (billions of years)
Apollo 11	1969	Mare Tranquillitatis	3.6
Apollo 15	1971	Mare Imbrium	3.3
Apollo 17	1972	Mare Serenitatis	3.8
Chang'e 5	2020	Oceanus Procellarum	2.0

The Apollo program missions were spaceflights to the moon led by the United States during the 1960s and 1970s during which astronauts collected some samples of the moon's surface. More recently, China launched the Chang'e 5 mission, which returned additional lunar surface samples. Researchers have analyzed and dated each of the samples, concluding that the lunar samples collected during the Chang'e 5 mission are significant because _____.

13

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

- (A) they are much younger than the samples brought back from any of the Apollo missions.
- (B) they were collected from the same landing site as the Apollo 11 mission.
- (C) they are closest in age to the samples brought back by the Apollo 17 mission.
- (D) they helped confirm the predicted ages of the lunar samples from the Apollo missions.

Biologist Rosanna Alegado believes that we might learn how multicellular organisms developed from single-celled ones if we understand why the single-celled organism *Salpingoeca rosetta*, the oldest living relative of animals, sometimes forms colonies of cells. Alegado and colleagues reviewed data from many studies of how *S. rosetta* responds when exposed to another type of single-celled organism, bacteria, including Eric W. Triplett's work with *Dyadobacter fermentans* bacteria and Jung-Hoon Yoon's work with *Algoriphagus marincola* bacteria. Alegado and colleagues concluded that both *D. fermentans* and *A. marincola* might have played a role in the development of multicellular organisms.

14

Which finding, if true, would most directly support Alegado and colleagues' conclusion?

- (A) *S. rosetta* tended to form colonies when exposed to *A. marincola* but not when exposed to *D. fermentans*.
- (B) Although several studies involving other bacteria species found that *S. rosetta* tended to form colonies after bacteria exposure, only the studies using *D. fermentans* and *A. marincola* tested whether the amount of bacteria exposure affected the rate of colony formation.
- (C) *S. rosetta* tended to form colonies when exposed to *D. fermentans* but not when exposed to *A. marincola*.
- (D) *S. rosetta* tended to form colonies when exposed to *D. fermentans* and when exposed to *A. marincola*.

The Millennium Cohort Study (MCS) examines trends in childhood development among 19,000 people in the United Kingdom unfolding over many years. As is true of most longitudinal studies, this need for years of data collection results in high costs. By contrast, a relatively straightforward fitness study, such as one that is merely trying to identify the percentage of regular exercisers in a city who do weight training, may not need a large budget because _____.

15

Which choice most logically completes the text?

- (A) 19,000 people is more than enough for MCS to find trends in childhood development.
- (B) longitudinal methods are probably suitable for the fitness study.
- (C) the fitness study can be done well without years of data collection.
- (D) it would be easy for MCS researchers to add questions to their childhood development study.

Oyster mushrooms typically get their nutrients from the damp logs on which they grow, but the fungi are also carnivorous, with the ability to kill and consume microscopic worms known as nematodes. As researcher Yen-Ping Hsueh has shown, the mushrooms release a toxin that is deadly to nematodes that _____ in contact with it.

Cut, bent, and welded from discarded metal materials, the sculptures of London-based Nigerian artist Sokari Douglas Camp are meant to challenge viewers to consider their own relationships to material _____. Her thought-provoking works in the 1999 exhibition Sokari Douglas Camp at the Smithsonian Institution's National Museum of African Art in Washington, DC, were no different.

The liquid compounds tetradecane ($C_{14}H_{30}$) and dodecane ($C_{12}H_{26}$) have molar masses of 198.39 and 170.33 _____. Mass helps convert between the mass of the reactants and the mass of the product).

Scholars Tammy Kernodle and Paul Austerlitz have lent their expertise on Black history and music to an important new project: the Timeline of African American Music, a digital _____ through a rich combination of text, images, and music clips, traces the development of specific musical genres (such as funk and swing).

16

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

- (A) has come
- (B) comes
- (C) is coming
- (D) come

17

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

- (A) wastes;
- (B) wastes and to
- (C) wastes,
- (D) wastes

18

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

- (A) g/mol (respectively, in stoichiometry, molar
- (B) g/mol, respectively, (in stoichiometry, molar
- (C) g/mol. Respectively, in stoichiometry (molar
- (D) g/mol, respectively (in stoichiometry, molar

19

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

- (A) resource, that
- (B) resource, that,
- (C) resource that,
- (D) resource that

In Los Angeles County, California, bicycle paths such as the Expo Bikeway—which is about 15 miles long—have become an increasingly popular means of travel. Moreover, lawyer and cycling _____ has identified several features of the Los Angeles landscape, like its temperate climate and mostly flat roads, that make the city naturally bike-friendly.

20

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

- (A) advocate, Ernesto Hernandez-Lopez
- (B) advocate, Ernesto Hernandez-Lopez,
- (C) advocate Ernesto Hernandez-Lopez,
- (D) advocate Ernesto Hernandez-Lopez

While other even-toed ungulate species, such as the water buffalo (*Bubalus bubalis*), are among the most populous animal species on earth, the Przewalski's gazelle (*Procapra przewalskii*) has a total population between 700 and 800 ____ one of the criteria required for a species to be considered endangered.

21

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

- (A) individuals; fulfilling
- (B) individuals: fulfilling
- (C) individuals. Fulfilling
- (D) individuals, fulfilling

Ecologists like Renae Brodie use trophic pyramids to illustrate the food chain within a given ecosystem. At a typical pyramid's base are primary producers, like plants, followed by herbivores at the second trophic level, then omnivores and carnivores at the third.

_____ at the fourth, highest trophic level are apex predators, like eagles, that feed on the animals below.

22

Which choice completes the text with the most logical transition?

- (A) Lastly,
- (B) In fact,
- (C) For example,
- (D) Besides,

In a 2022 analysis of 200 terms, researchers found a broad pattern of valence-dependent mutation in which negative adjectives saw a faster rate of cognate replacement—the rate at which a word will be replaced over time with a noncognate form—than other words. _____ the adjective “illegal” would be expected to mutate faster than the noun “crisis.”

23

Which choice completes the text with the most logical transition?

- (A) Thus,
- (B) Moreover,
- (C) Meanwhile,
- (D) However,

In the early 1970s, Albert Popa took up graffiti art, spraying his work onto what was at the time an unconventional surface: concrete. _____ Albert's son David has chosen an unusual canvas for his new art project, *Fractured*. In this remarkable work, the artist draws charcoal faces onto fragmented ice floes in Finland, creating the visual effect of a face slowly fracturing.

24

Which choice completes the text with the most logical transition?

- (A) However,
- (B) Indeed,
- (C) Second,
- (D) Likewise,

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

- In 1965, Yale University historians claimed that a world map called the Vinland Map was drawn in the fifteenth century.
- Since that time, the map's age has been the subject of debate.
- In 2021, researchers conducted a study to analyze the elemental composition of the map's ink.
- Their analysis revealed that the ink contains a titanium compound not used in inks until the 1920s.
- The researchers concluded that the map was drawn in the twentieth century.

25

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

- (A) Given the debate about the Vinland Map's age, researchers in 2021 conducted a study to analyze the elemental composition of the map's ink.
- (B) A 2021 study of the Vinland Map's ink revealed that it contains a titanium compound not used in inks until the 1920s, indicating that the map was drawn in the twentieth century.
- (C) The Vinland Map, believed by some to have been drawn in the fifteenth century, was the focus of a 2021 study.
- (D) Aware that a certain titanium compound was not used in inks until the 1920s, researchers in 2021 studied the elemental composition of the Vinland Map's ink.

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

- The El Pinito Mountains are a mountain range located in northwestern Mexico.
- The range is one of the dozens of "sky islands" in the southwestern US and northwestern Mexico.
- A sky island is an isolated mountain range whose environment differs drastically from that of the surrounding lowlands.
- The US Forest Service (USFS) said, "The mountains are 'islands' surrounded by deserts that are 'seas.'"
- The USFS said, "Each Sky Island is a unique ecosystem."

26

The student wants to explain what a sky island is. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- (A) The USFS considers the El Pinito Mountains to be a "unique ecosystem."
- (B) The El Pinito Mountains are an isolated mountain range located in northwestern Mexico whose environment differs drastically from that of the surrounding lowlands.
- (C) A sky island is an isolated mountain range, such as the El Pinito Mountains in northwestern Mexico, whose environment differs drastically from that of the surrounding lowlands.
- (D) The El Pinito Mountains, which are considered to be a sky island, are located in northwestern Mexico.

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

- The International Center for the Arts of the Americas (ICAA) is directed by MariCarmen Ramirez.
- Ramirez oversaw an initiative to create an online archive of historical documents related to the history of Latin American and Latino visual art.
- The ICAA digitized over 10,000 documents, including the writings of Latin American and Latino artists and critics.
- The creation of the archive didn't require historical documents to be removed from their countries of origin.
- Scholars now have more access to these documents.

27

The student wants to explain an advantage of the ICAA's archive being digital. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- (A) Over 10,000 documents related to the history of Latin American and Latino visual art are part of the ICAA archive.
- (B) By offering online versions of historical documents, the ICAA's archive provides more access to these materials without removing them from their countries of origin.
- (C) Among the historical documents in the ICAA's archive are the writings of Latin American and Latino artists and critics.
- (D) The ICAA's director, Mari Carmen Ramirez, oversaw the creation of an online archive of historical documents related to Latin American and Latino visual art.

Though not closely related, the hedgehog tenrecs of Madagascar share basic _____ true hedgehogs, including protective spines, pointed snouts, and small body size—traits the two groups of mammals independently developed in response to equivalent roles in their respective habitats.

1

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

- (A) examples of
- (B) concerns about
- (C) indications of
- (D) similarities with

Sarah Marquis, who walked 16,000 kilometers across Asia, Siberia, and Australia, undoubtedly accomplished much, but her place in our historical memory is perhaps more _____ than that of a noteworthy “first” such as Anésia Pinheiro Machado, who was the first female pilot in Brazil to carry passengers and the first to make stunt flights, a deed for which she will always be remembered.

2

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

- (A) enduring
- (B) uncertain
- (C) conspicuous
- (D) deserving

When considering which plays and musicals to produce, theaters in Miami often favor keeping audiences happy over taking risks. So while they might be eager to produce an established classic like *Crazy for You*, for example, most would be ____ to stage a work from a relatively unknown playwright.

3

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

- (A) surprised
- (B) determined
- (C) fortunate
- (D) hesitant

Some robots such as Surena (developed in 2008) and COMAN (developed in 2012) are designed to resemble humans so that people will find it easier to interact with them. To that end, certain features such as the ability to respond to voice commands can help to ____ people's feelings of comfort, but a robot that looks too human can fall into the "uncanny valley," meaning that its appearance unintentionally unsettles those who encounter it.

4

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

- (A) constrict
- (B) repudiate
- (C) buttress
- (D) mitigate

While recent scholarship has undermined claims that the works of twelfth-century Islamic philosopher Ibn Rushd were ____ other Muslim philosophers of his time, it is indisputable that his location in the Muslim-ruled area of what is now Spain meant that his works were primarily available thousands of miles west of the era's center of Islamic thought.

5

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

- (A) controversial among
- (B) antagonistic toward
- (C) imitated by
- (D) inconsequential to

Community science, which involves professional scientists collaborating with amateur science enthusiasts to study a topic, is often an effective and engaging way to conduct research. It can allow people to assist with conservation efforts, spark youth interest in science, and increase the amount of data researchers can collect. This approach was essential to the success of a study by biologist Abigail Merrill and colleagues of how butterfly color relates to flower choice, which included findings from hundreds of students and community members in northwestern Arkansas.

6

Which choice best describes the overall structure of the text?

- (A) It introduces the topic of a scientific study, describes the study's importance, and then presents the study's results.
- (B) It identifies a particular approach to research, lists some benefits of that approach, and then mentions a study in which that approach was used.
- (C) It argues for a new approach to scientific research, comments on the public's opinion about the approach, and then describes how that approach was applied in a certain study.
- (D) It describes the development of a type of scientific collaboration, shows how that type of collaboration has been used in a particular field of study, and then suggests future collaborative projects.

Text 1

In separate studies, Lingbo Meng and colleagues and Xinhua He and colleagues examined whether plants transfer nutrients to one another using a common mycorrhizal network (CMN)—a lattice of fungal strands in the soil. Meng and colleagues excluded all pathways other than the CMN by using barriers to keep the plants' root systems separate while allowing mycorrhizal strands through—a crucial step He and colleagues' study did not take.

Text 2

Meng and colleagues took the necessary precaution of separating the plants' root systems (thereby excluding root-to-root transmission). However, any barrier used must allow the thread-like hyphae of a CMN to pass through, and this permeability would also allow liquids through. Thus, the researchers' experimental design cannot ensure that any nutrient transfer observed can be attributed to a CMN and not to some other pathway.

7

Based on the texts, the author of Text 1 and the author of Text 2 would most likely give the same answer to which question?

- (A) Did He and colleagues' study effectively exclude any nutrient pathway other than a CMN?
- (B) Are the barriers used in Meng and colleagues' study sufficient to ensure that nutrient transfer could only occur via a CMN?
- (C) Is there an available barrier material that can block roots and liquids while allowing fungal strands through?
- (D) Do plants that transfer nutrients through a root-to-root pathway also transmit nutrients via a CMN?

Researchers César A. Hidalgo, Elisa Castañer; and Andres Sevtsuk created a computer model to predict the mix of businesses and places of interest found in a given neighborhood. The team used data from the Google Places API service to help identify movie theaters, gyms, and other businesses and map their locations. This approach has some limits—data from Places API tend to be restricted to places that are customer facing—but the data set nonetheless provides an extremely reliable source to study colocation patterns of neighborhood amenities.

8

According to the text, what is one potential drawback of Hidalgo and colleagues' method?

- (A) It may lead to conclusions that are not reflective of all the amenities in a given neighborhood.
- (B) It is likely to contribute to inaccurate identifications of the boundaries of specific neighborhoods.
- (C) It is based on recent advancements from other fields that have yet to be applied outside of those contexts.
- (D) It depends upon data that are likely to be outdated.

Vadamalai Elangovan and Ganapathi Marimuthu showed that high moonlight intensity inhibits the activity of the greater short-nosed fruit bat (*Cynopterus sphinx*), a finding explicable in terms of benefits and costs: greater lunar intensity may not enable the bats to increase foraging success enough to offset the higher chance of detection by predatory owls or hawks. Though many other nocturnal mammals respond to lunar intensity variations similarly to greater short-nosed fruit bats, mongoose lemurs (*Eulemur mongoz*) display the opposite pattern, as their heavy reliance on visual foraging results in a different balance of reward and risk.

9

According to the text, what did Elangovan and Marimuthu find and why does that occur?

- (A) Greater short-nosed fruit bats tend to be more active during periods of high lunar intensity than at other times because such conditions allow them to increase their foraging success without making them easier to detect.
- (B) Greater short-nosed fruit bats reduce their activity during periods of high lunar intensity because predators can more easily spot the bats in brighter conditions, and such conditions do not benefit the bats enough to justify that risk.
- (C) During periods of high lunar intensity, greater short-nosed fruit bats reduce their activity because it is easier for predators to detect the bats in relatively bright conditions than it is for predators to detect mongoose lemurs in such conditions.
- (D) During periods of high lunar intensity, mongoose lemurs show a different behavioral response than greater short-nosed fruit bats and many other nocturnal mammals do because the risks to mongoose lemurs under such conditions are greater.

A number of artists associated with hyperpop, a movement in electronic music that emerged in the 2010s, aggressively manipulate their recorded voice. The duo 100 gecs, for example, shifts the pitch of lead singer Laura Les's vocals to be much higher than that of her natural range. And even the hyperpop artists who don't rely on pitch-shifting, such as Shygirl, often distort their vocals using digital tools. Rather than being an arbitrary stylistic choice, hyperpop's persistent modification of the voice functions as a commentary on how digital technology mediates human experience today.

"The Yellow Wallpaper" is an 1892 short story by Charlotte Perkins Gilman. In the story, the narrator expresses mixed feelings about her surroundings:

10

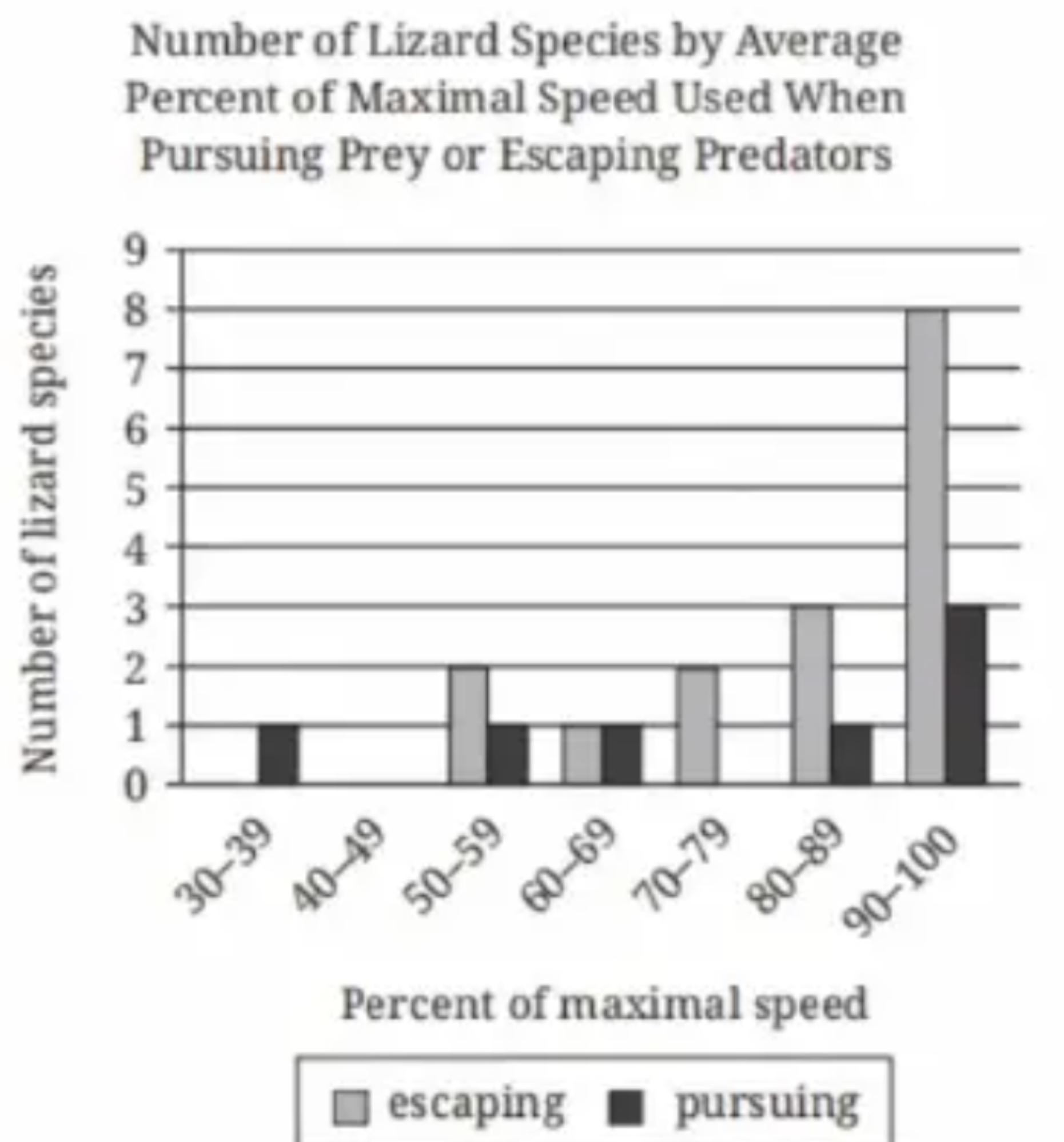
Based on the text, the author would be most likely to disagree with which statement about vocal manipulation in hyperpop?

- (A) It is an aesthetic feature that has little or no social import.
- (B) It confirms hyperpop's ability to offset certain negative effects of digital technology.
- (C) It is a symbol of the influence that hyperpop exerts on listeners' sense of self.
- (D) It represents changes to human experience brought about by technology.

11

Which quotation from "The Yellow Wallpaper" most effectively illustrates the claim?

- (A) "This wallpaper has a kind of sub-pattern in a different shade, a particularly irritating one, for you can only see it in certain lights, and not clearly then."
- (B) "By moonlight—the moon shines in all night when there is a moon—I wouldn't know it was the same paper."
- (C) "I'm really getting quite fond of the big room, all but that horrid [wall]paper."
- (D) "The color is repellent, almost revolting; a smouldering, unclean yellow, strangely faded by the slow-turning sunlight."



It may seem that the optimal strategy for an animal pursuing prey or escaping predators is to move at maximal speed, but the energy expense of exploiting full speed capacity can disfavor such a strategy even in escape contexts, as evidenced by the fact that _____

The small white heron and the little blue 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 these birds' habitats, such as how quickly water drains from the area and the amount of tree-canopy cover there is in the area. They found that small white herons prefer areas with extensive canopy cover, but this was not true for little blue herons. The researchers therefore concluded that wetland-management strategies that increase the amount of tree canopy in potential wetland bird habitats are less likely to _____

12

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

- (A) most lizard species use about the same percentage of their maximal speed when escaping predation as they do when pursuing prey.
- (B) multiple lizard species move at an average of less than 90% of their maximal speed while escaping predation.
- (C) more lizard species use, on average, 90%–100% of their maximal speed while escaping predation than use any other percentage of their maximal speed.
- (D) at least 4 lizard species use, on average, less than 100% of their maximal speed while pursuing prey.

13

Which choice most logically completes the text?

- (A) attract little blue herons to the area than they are to attract small white herons to the area.
- (B) extend the average lifespan of small white herons already in the area than they are to attract a greater number of those birds to the area.
- (C) decrease the area's appeal to both small white herons and little blue herons than they are to increase the appeal to other species.
- (D) attract birds that don't typically live in wetlands to the area than they are to attract small white herons or little blue herons to the area.

Biologists Rebecca M. Calisi-Rodriguez and George E. Bentley examined research on white-throated sparrows and unstriped Nile rats, both of which have been studied in the laboratory as well as in the wild, to see how studies' settings might have affected their results. Lab studies are useful because they make it easy to control important variables, but white-throated sparrows' surroundings can significantly affect their hormone levels. Therefore, it's not altogether surprising that when Calisi-Rodriguez and Bentley examined studies of white-throated sparrows, they found that _____.

Woven from recycled yarn and hand tufted using a carpet weaving technique passed down by the artist's Turkish grandmother; _____ so lush and tactilely inviting that you are tempted to reach out and touch them.

The editors of *Home Ground: A Guide to the American Landscape* turned to the _____ to craft the entry about "muskeg," a term referring to terrain containing peat bogs and stunted trees.

14

Which choice most logically completes the text?

- (A) hormone levels were higher in wild males than in captive male unstriped Nile rats.
- (B) baseline levels of the hormone corticosterone are higher in captive sparrows than they are in wild sparrows.
- (C) captive sparrows and wild sparrows usually exhibited very similar hormone levels.
- (D) significant differences in hormone levels between individuals were found for both captive sparrows and wild sparrows.

15

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

- (A) the topological tapestries of Argentine textile artist Alexandra Kehayoglou are
- (B) the Argentine textile artist Alexandra Kehayoglou creates topological tapestries that are
- (C) when she creates her topological tapestries, Argentine textile artist Alexandra Kehayoglou makes them
- (D) Alexandra Kehayoglou is an Argentine textile artist whose topological tapestries are

16

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

- (A) essayist, Carolyn Servid
- (B) essayist, Carolyn Servid,
- (C) essayist Carolyn Servid,
- (D) essayist Carolyn Servid

Featured in *The New Woman Behind the Camera* (2021) is a photograph taken in 1932 by Alma _____. “Self-Portrait,” Lavenson’s image contributes to the exhibition’s goal of showcasing the diverse, innovative, often aesthetically daring work of female photographers from the 1920s through the 1950s.

17

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

- (A) Lavenson. Titled
- (B) Lavenson titled
- (C) Lavenson, titled
- (D) Lavenson and titled

In her 1983 book *The Managed Heart: Commercialization of Human Feeling*, sociologist Arlie Russell Hochschild first explored at length her conception of a “sociology of emotions”—the idea that the various cultural and ideological frameworks a person has internalized (class, gender, political affiliation, etc.) ____ each emotional reaction that person has within a situation.

18

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

- (A) underlies
- (B) is underlying
- (C) underlie
- (D) has been underlying

Photographer Mária Svarbová has reached audiences well beyond her home country of Slovakia. In 2021, her work was featured at Galerie LeRoyer in _____. the exhibited photographs, with their vivid pastel colors, overexposed tones, and mirrorlike symmetry, captivated audiences.

19

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

- (A) Canada, for example,
- (B) Canada, for example
- (C) Canada; for example,
- (D) Canada, for example;

In 2003, a study led by the researcher Alison G. Boyer investigated the relationship between grassland arthropod populations and agricultural _____. macronutrients like nitrogen, phosphorus, and potassium, such fertilizers boost the productivity of crops. potentially offering more nutrients for arthropods.

20

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

- (A) fertilizers, which contain
- (B) fertilizers, containing
- (C) fertilizers containing
- (D) fertilizers. Containing

The world's first airplane, the 1903 Wright Flyer, was not very aerodynamic, as evidenced by its low lift-to-drag ratio of just 8.3 : 1. The Northrop F-5 jet, like most modern aircraft, is far more aerodynamic. _____ its lift-to-drag ratio is more than twice that of the Wright Flyer.

21

Which choice completes the text with the most logical transition?

- (A) Specifically,
- (B) In conclusion,
- (C) However,
- (D) Nevertheless,

With many elements, like osmium, scientists were able to isolate a relatively pure sample of the substance shortly after discovering its existence. _____ this wasn't the case with all elements. The process of isolating magnesium, for example, took years—53, to be precise.

22

Which choice completes the text with the most logical transition?

- (A) In other words,
- (B) For this reason,
- (C) Granted,
- (D) Likewise,

Modernista architects championed nature in their designs. _____ the dramatic archways and bird-themed mosaics of Casa Lleó i Morera, a Modernista private home designed by Lluís Domènech i Montaner, couldn't exactly grow in a forest. Still, one sees natural influences in Domènech i Montaner's penchant for curves (rather than right angles) and plant- and animal-inspired flourishes.

23

Which choice completes the text with the most logical transition?

- (A) Of course,
- (B) Thus,
- (C) Furthermore,
- (D) Similarly,

Before the first railroads were built in Australia, engineers warned against using multiple track widths across the continent. _____ regional officials couldn't agree on a single-width system. Thus, railways in Victoria, like the Victorian Goldfields Railway, were made using wide tracks, while those in New South Wales were built with narrow tracks.

24

Which choice completes the text with the most logical transition?

- (A) In other words,
- (B) Similarly,
- (C) For this reason,
- (D) Nevertheless,

Legislators in Ethiopia are elected via a first-past-the-post electoral system. In this winner-take-all voting system, the seat is awarded to the candidate who receives not a majority but a plurality (i.e., greatest number) of votes. _____ if several popular candidates are vying for the same seat, it is possible for a candidate to win an election despite receiving less than 50% of the votes.

25

Which choice completes the text with the most logical transition?

- (A) However,
- (B) Moreover,
- (C) Accordingly,
- (D) Similarly,

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

- Huazalingo 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.
- Huazalingo's population was 12,766 in 2020.
- Its population was 12,779 in 2010. Hidalgo is divided into 84 municipalities.

26

The student wants to emphasize the 2020 population of Huazalingo. Which choice most effectively uses relevant information from the notes to accomplish this goal?

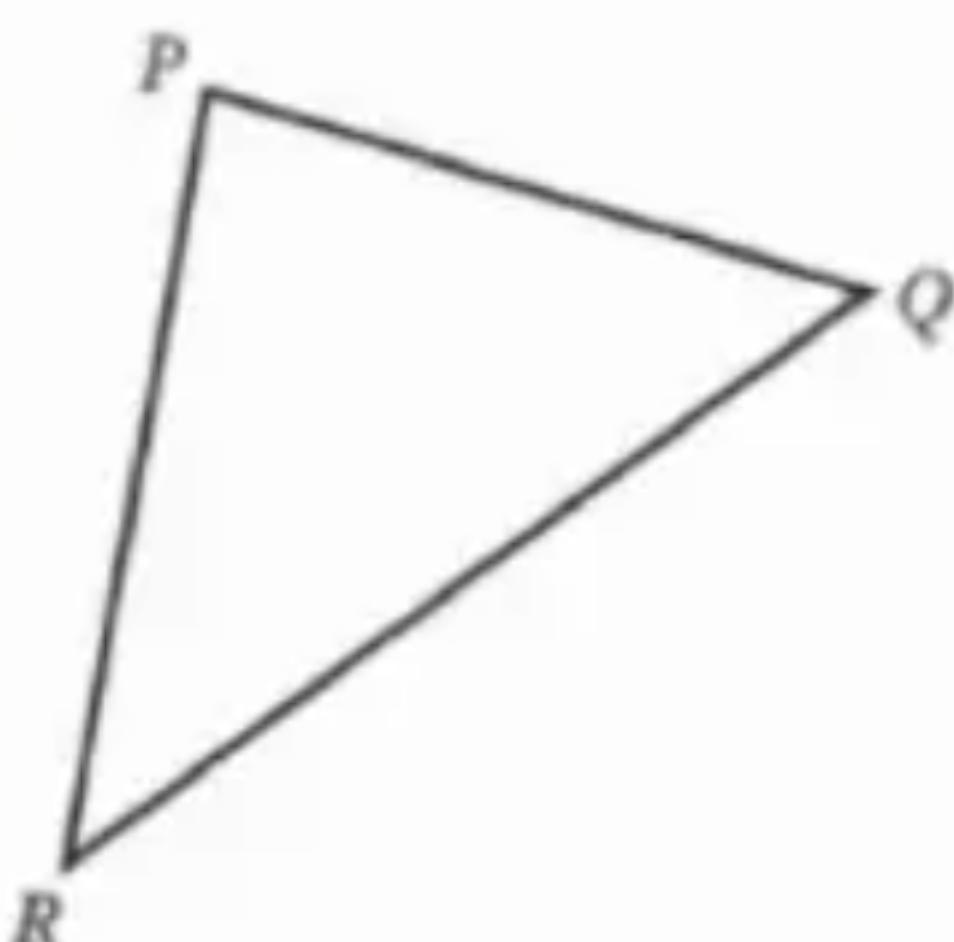
- (A) As a municipality in Hidalgo, Huazalingo is responsible for providing public services to its population.
- (B) As of 2020, Huazalingo was one of 84 municipalities in Hidalgo, Mexico.
- (C) In 2020, the municipality of Huazalingo had a population of 12,766.
- (D) Home to 12,779 people, the governmental region was responsible for providing traffic control to its population in 2010.

- Vexillology is the study of flags.
- The flags of many countries include symbols like animals, plants, or landforms.
- These symbols often represent an aspect of the region's history, culture, or landscape.
- The flag of Slovakia includes the Tatra, Mátra, and Fatra mountains.
- The flag of Kiribati includes a frigatebird.

27

Which choice most effectively uses information from the given sentences to make and support a generalization about symbols on flags?

- (A) Vexillology is the study of flags; accordingly, vexillologists are interested in flags from around the world.
- (B) Slovakia's flag includes the Tatra, Mátra, and Fatra mountains, a symbol that is important to that country's national identity.
- (C) Many countries feature symbols on their flags, and the study of these designs is known as vexillology.
- (D) The flags of some countries include symbols of landforms; Slovakia's, for example, includes the Tatra, Mátra, and Fatra mountains.

1

Note: Figure not drawn to scale.

In triangle PQR , the measure of $\angle P$ is 47° , and the measure of $\angle Q$ is 83° . What is the measure of $\angle R$?

- (A) 36°
- (B) 50°
- (C) 94°
- (D) 130°

2

	Live north of Center St.	Live south of Center St.	Total
Less than 45 years old	16	13	29
At least 45 years old	19	87	106
Total	35	100	135

The table summarizes members of a local organization by age and whether they live north or south of Center St. If a member of the organization is selected at random, what is the probability that the selected member is at least 45 years old?

- (A) $\frac{29}{135}$
- (B) $\frac{35}{135}$
- (C) $\frac{100}{135}$
- (D) $\frac{106}{135}$

3

If $3x + 4 = 10$, what is the value of $9x - 4$?

5

Line q in the xy -plane has a slope of -9 and passes through the point $(0, 14)$. Which equation defines line q ?

(A) $y = -9x + 14$

(B) $y = 9x + 14$

(C) $y = 14x - 9$

(D) $y = 14x + 9$

4

The function f is defined by $f(x) = 2x^2 - 5x$. What is the value of $f(8)$?

6

For a 2-week period in a town in Iowa, the lowest recorded temperature was 26 degrees Fahrenheit ($^{\circ}\text{F}$) and the highest recorded temperature was 63°F . Which inequality is true for any recorded temperature t , in $^{\circ}\text{F}$, in this town for this 2-week period?

(A) $t \leq 26$

(B) $26 \leq t \leq 63$

(C) $t \geq 63$

(D) $t \geq 89$

7

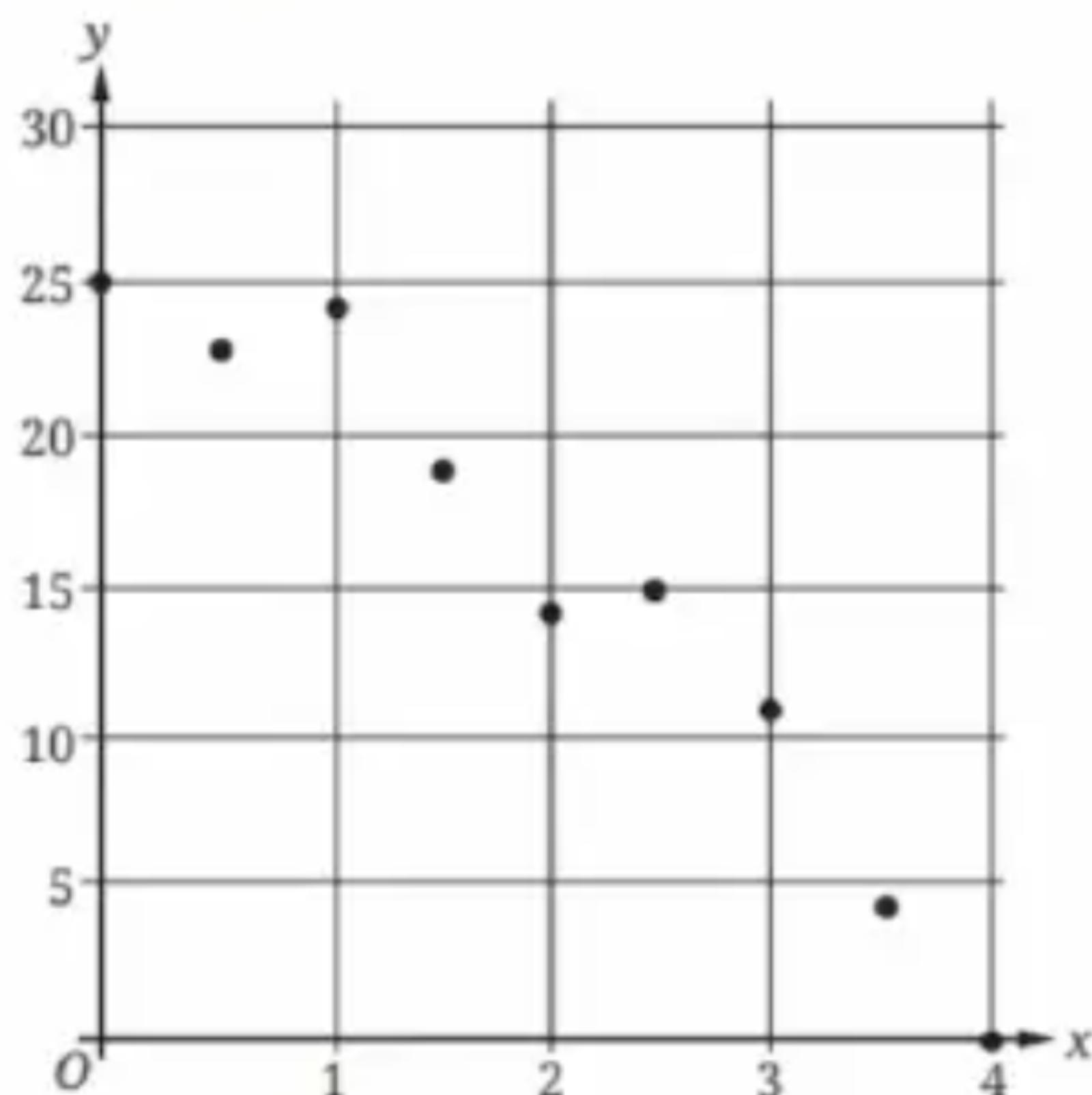
$$\frac{j}{4} = k + 13m$$

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

- (A) $j = k + 7(13m)$
- (B) $j = 7(k + 13m)$
- (C) $j = 7k + 13m$
- (D) $j = \frac{k + 13m}{7}$

9

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



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

- (A) $y = -6 + 27x$
- (B) $y = 6 - 27x$
- (C) $y = 27 + 6x$
- (D) $y = 27 - 6x$

8

A student council group is selling car stickers for a fundraiser. They use the function $p(x) = 5x - 190$ to determine their profit $p(x)$, in dollars, for selling x car stickers. In order to earn a profit of \$600, how many car stickers must they sell?

10

A batch of smoothies consists of 4 cups of milk and 2 bananas and has 1,226 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) 5
- (B) 10
- (C) 461
- (D) 1,216

**12**

Which of the following expressions is equivalent to $12x^{10} - 12x^9 + 120x$?

- (A) $x(11x^{10} - 11x^9 + 119x)$
- (B) $x(12x^{10} - 12x^9 + 120)$
- (C) $12x(x^{10} - x^9 + 10x)$
- (D) $12x(x^9 - x^8 + 10)$

11

$$f(x) = 7,000(0.90)^x$$

A conservation scientist implemented a program to reduce a certain invasive insect population in an area. The given function estimates this insect species' population x years after 2008, where $x \leq 8$. Which of the following is the best interpretation of 7,000 in this context?

- (A) The estimated initial insect population for this species and area in 2008
- (B) The estimated insect population for this species and area 8 years after 2008
- (C) The estimated percent decrease in the insect population for this species and area each year after 2008
- (D) The estimated percent decrease in the insect population for this species and area every 8 years after 2008

13

The measure of angle F is $\frac{7\pi}{4}$ radians. What is the value of $\cos(F)$?

- (A) $-\frac{\sqrt{2}}{2}$
- (B) $-\frac{1}{2}$
- (C) $\frac{\sqrt{2}}{2}$
- (D) $\frac{\sqrt{3}}{2}$

14

Line k has a slope of 6 and a y -intercept of $(0, 60)$. What is the x -coordinate of the x -intercept of line k ?

16

The function g is defined by $g(x) = -\frac{x}{3} + 11$. What is the x -intercept of the graph of $y = g(x) + 6$ in the xy -plane?

- (A) $(-33, 0)$
- (B) $(-51, 0)$
- (C) $(33, 0)$
- (D) $(51, 0)$

**15**

A hemisphere is half of a sphere. If a hemisphere has a radius of 56 inches, which of the following is closest to the volume, in cubic inches, of this hemisphere?

- (A) 6,600
- (B) 26,300
- (C) 275,900
- (D) 367,800

**17**

An auditorium has seats for 2,600 people. Tickets to attend a show at the auditorium currently cost \$8.00. For each \$1.00 increase to the ticket price, 100 fewer tickets will be sold. This situation can be modeled by the equation $y = -100x^2 + 1,800x + 20,800$, where x represents the increase in ticket price, in dollars, and y represents the revenue, in dollars, from ticket sales. If this equation is graphed in the xy -plane, at what value of x is the maximum of the graph?

- (A) 8
- (B) 9
- (C) 18
- (D) 26

18

$$k + 21 = 63$$

What is the solution to the given equation?

- (A) 3
- (B) 42
- (C) 84
- (D) 1,323

20

$$ax + by = 96$$

$$2ax + 8y = 72$$

In the given system of equations, a and b are constants. The graphs of these equations in the xy -plane intersect at the point $(x, 6)$. What is the value of b ?

- (A) 4
- (B) 6
- (C) 8
- (D) 14

19

The function f gives the product of a number, x , and a number that is 45 more than x . Which equation defines f ?

- (A) $f(x) = x^2 + x + 45$
- (B) $f(x) = x^2 + 45$
- (C) $f(x) = x^2 + 45x$
- (D) $f(x) = x^2 + 45x + 45$

21

If the perimeter of an equilateral triangle with a height of 21 is $a\sqrt{3}$, what is the value of a ?

22

An object's speed is increasing at a rate of 10.5 meters per second squared. What is this rate, in miles per minute squared, rounded to the nearest tenth?
(Use 1 mile = 1,609 meters.)

- (A) 0.4
- (B) 23.5
- (C) 153.2
- (D) 281.6

1

The table summarizes the UV index value recorded by a research assistant at noon each day for 48 days.

UV index	Number of days
1	8
2	13
3	12
4	15

According to the table, a UV index value of 1 was recorded on how many days?

- (A) 48
- (B) 40
- (C) 8
- (D) 4

3

The speed of a white-throated needletail, a type of bird, in flight was measured to be 79 miles per hour. What was the white-throated needletail's measured speed, in kilometers per hour? (Use 1 mile = 1.6 kilometers.)

- (A) 126.4
- (B) 80.6
- (C) 77.4
- (D) 49.4

2

The function j is defined by $j(x) = \frac{x}{7}$. What is the value of $j(42)$?

- (A) 42
- (B) 35
- (C) 7
- (D) 6

4

$$(2x^2 + 8x - 6) - (4x^2 + 7x)$$

The given expression is equivalent to $-2x^2 + ax - 6$, where a is a constant. What is the value of a ? _____

5

What is the y -intercept of the graph of $y = 11^x$ in the xy -plane?

- (A) $(0, 1)$
- (B) $(0, 0)$
- (C) $(0, 11)$
- (D) $(0, 10)$

7

To cut a lawn, Antwan charges a fee of \$15.00 for his equipment and \$8.50 per hour spent cutting a lawn. Taylor charges a fee of \$12.00 for her equipment and \$9.00 per hour spent cutting a lawn. If x represents the number of hours spent cutting a lawn, what are all the values of x for which Taylor's total charge is greater than Antwan's total charge?

- (A) $5 \leq x \leq 6$
- (B) $6 \leq x \leq 7$
- (C) $x < 5$
- (D) $x > 6$

6

$$y = x + 19$$

$$y = -x + 33$$

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

- (A) 14
- (B) 26
- (C) 52
- (D) 104

8

The table summarizes the number of objects in each group.

Group	Number of objects
A	375
B	54
C	690
D	81
Total	1,200

The number of objects in group C is $p\%$ of the number of objects in group A. What is the value of p ?

9

Which quadratic equation has exactly one distinct real solution?

(A) $-97x^2 = 0$

(B) $9x^2 + 3 = 0$

(C) $9x^2 + 3x + 1 = 0$

(D) $-97x^2 - 97x = 0$

10

$$x^2 + 9x + 5 = 0$$

One solution to the given equation can be written as

$x = \frac{-9 + \sqrt{k}}{2}$, where k is a constant. What is the value of k ?

12

If $17 - 5(4 - 7x) = 4 - 6(4 - 7x)$, what is the value of $4 - 7x$?

11

The table gives the distribution of favorite core subject and grade level for 80 students.

Subject	Grade level			
	Sixth	Seventh	Eighth	Total
English	4	9	9	22
Mathematics	10	1	9	20
Science	4	6	4	14
Social studies	6	9	9	24
Total	24	25	31	80

If a student is selected at random, what is the probability of selecting a student whose favorite core subject is mathematics?

(A) $\frac{1}{10}$

(B) $\frac{1}{5}$

(C) $\frac{1}{4}$

(D) $\frac{2}{3}$

14

The function f is defined by $f(x) = 41(0.28)^x$. For any positive integer n , the value of $f(n)$ is $p\%$ less than the value of $f(n-1)$. What is the value of p ?

(A) 72

(B) 59

(C) 41

(D) 28

13

A rectangular poster has an area of 360 square inches. A copy of the poster is made in which the length and width of the original poster are each increased by 40%. What is the area of the copy, in square inches?

15

$$5x = 75y - 125$$

One of the two equations in a system of linear equations is given. The system has no solution. Which equation could be the second equation in this system?

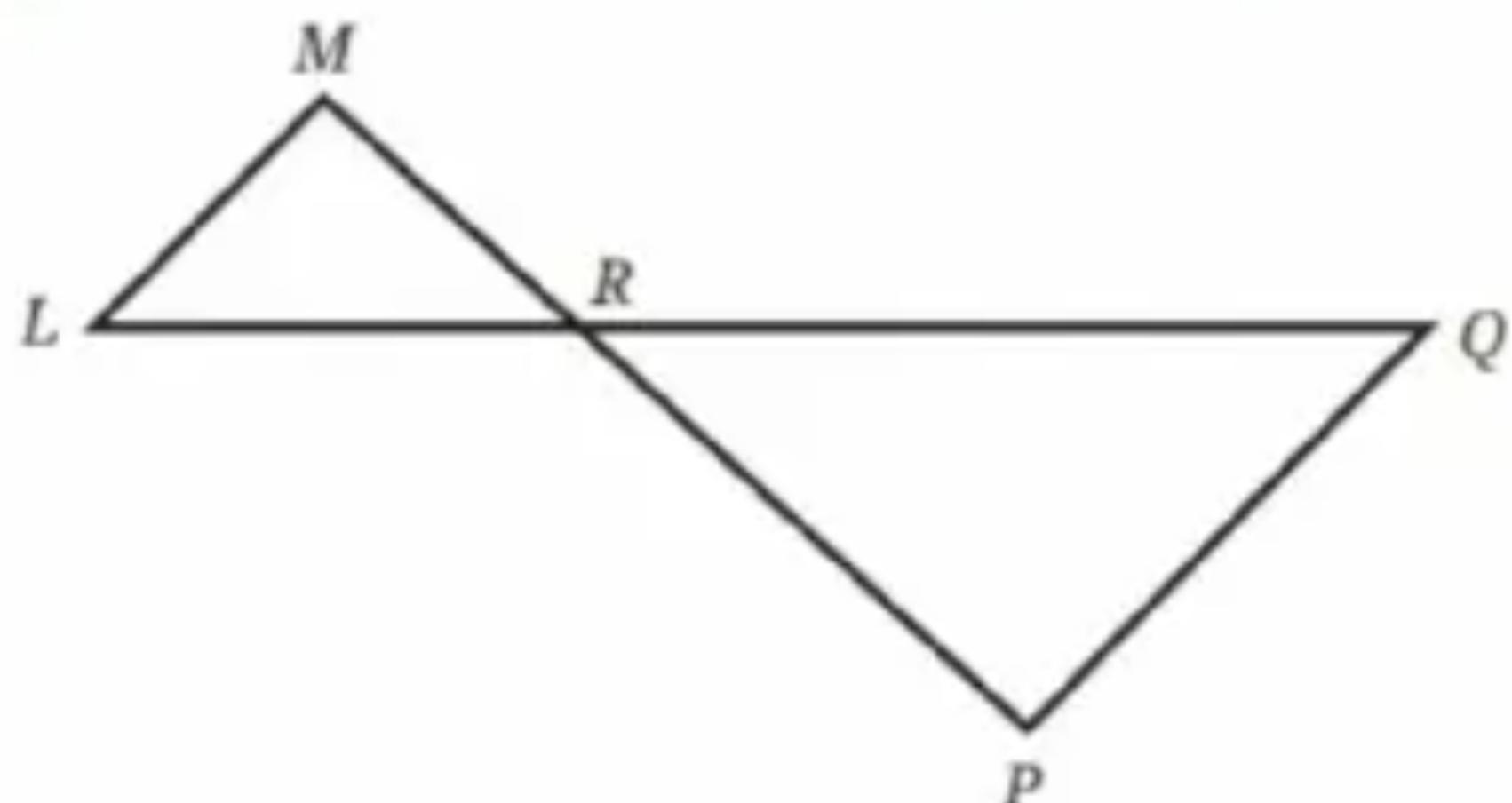
- (A) $x = 3y$
- (B) $\frac{1}{5}x = 3y$
- (C) $x = 15y - 25$
- (D) $\frac{1}{5}x = 15y - 25$

16

$$f(x) = (x - a)(x - b)$$

The function f is defined by the given equation, where a and b are integer constants. If $f(35) > 0$, $f(38) < 0$, and $f(41) > 0$, which of the following could be the value of $a + b$?

- (A) 38
- (B) 40
- (C) 73
- (D) 75

18

Note: Figure not drawn to scale.

In the figure, \overline{LQ} intersects \overline{MP} at point R , and \overline{LM} is parallel to \overline{PQ} . The lengths of \overline{MR} and \overline{RP} are 9 and 17 units, respectively. The area of $\triangle LMR$ is 45 square units. What is the area of $\triangle PQR$, in square units?

- (A) $\frac{3,645}{289}$
- (B) $\frac{405}{17}$
- (C) 85
- (D) $\frac{1,445}{9}$

17

$$\sqrt{x^2 - 20x + 100} - 11x = 0$$

What are all possible solutions to the given equation?

- (A) -1
- (B) $\frac{5}{6}$
- (C) -1 and 1
- (D) -1 and $\frac{5}{6}$

19

$$6x^2(3x - 16)(3x - u) = 0$$

In the given equation, u is a positive constant. The sum of the solution to the equation is 13. What is the value of u ?

21

Function f is a quadratic function. The graph of $y = f(x)$ in the xy -plane has a vertex at $(9, -7)$, contains the point $(8, -9)$, and has a y -intercept at $(0, a)$. The graph of $y = 6 \cdot f(x)$ has a y -intercept at $(0, b)$. What is the positive difference between a and b ?

**20**

The cost of renting a power washer is \$44 for the first day and \$22 for each additional day. Which of the following functions gives the cost $C(d)$, in dollars, of renting the power washer for d days, where d is a positive integer?

(A) $C(d) = 22d + 22$

(B) $C(d) = 22d + 44$

(C) $C(d) = 44d - 22$

(D) $C(d) = 44d + 66$

22

A 9-pound cat eats two types of canned cat food: chicken-flavored and duck-flavored. The recommended amount of chicken-flavored food is 2.25 cans per 8 pounds of a cat's weight per day. The recommended amount of duck-flavored food is 0.75 cans per 5 pounds of a cat's weight per day. If c is the number of chicken-flavored cans and d is the number of duck-flavored cans a 9-pound cat eats in one day, which equation describes all the possible values of c and d for the cat to eat the recommended amount of food based on its weight?

(A) $\frac{0.75}{5}c + \frac{2.25}{8}d = 9$

(B) $\frac{2.25}{8}c + \frac{0.75}{5}d = 9$

(C) $\frac{5}{0.75}c + \frac{8}{2.25}d = 9$

(D) $\frac{8}{2.25}c + \frac{5}{0.75}d = 9$

Anwer:

M1

1–5 BBABB

6–10 BCBBB

11–15 ADADC

16–20 DADCD

21–25 DAADB

26–27 CB

M2

1–5 DBDCD

6–10 BDABA

11–15 CBADA

16–20 DACDD

21–25 ACADC

26–27 CD

Anwer:

M1

1–5 B,D,14,88,A

6–10 B,B,158,D,A

11–15 A,D,C,-10,D

16–20 D,B,B,C,D

21–22 42,B

M2

1–5 C,D,A,1,A

6–10 C,D,184,A,61

11–15 C,-13,705.6,A,B

16–20 D,D,D,23,A

21–22 845,D