Section 1, Module 1: Reading and Writing

Question 1

Farmhouse Interior, painted in the realist style by Jan Hendrik Weissenbruch, depicts a peasant woman knitting at a table while a cat sits underneath. The realists' emphasis on accurately portraying the experiences of average working people was largely a rejection of the romantic style evident in many paintings by Pierre-Auguste Cot, which instead _____ blank their subjects' positive traits, altering subjects to appear more beautiful or heroic than they actually were.

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

A) rectify

B) apprehend

C) counteract

D) magnify

Question 2

The tomato was domesticated in South America. Its physical structure is no longer identical to the structure of the wild plant it is descended from. Maize (corn) also _ _ _ _ _ _ blank its wild ancestor. That ancestor plant had a few small kernels. Indigenous people in Mexico carefully bred the crop until it had numerous fleshy kernels.

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

A) **varies from**

B) helps with

C) reacts to

D) argues with

Question 3

The collectibles market is one of the most difficult segments of the consumer economy to _ _ _ _ _ _ blank. Few economists would have predicted, for example, that the prices of vintage My Little Pony figures would soar in the 2010s, but soar they did.

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

A) avoid

B) **forecast**

C) exchange

D) monitor

Question 4

Cochabamba, Bolivia, was named a City of Gastronomy by UNESCO in 2017, a title that _ _ _ _ _ _ blank that Cochabamba has a unique and vibrant food culture worthy of celebration.

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

A) complains

B) discovers

C) renounces

D) **denotes**

Question 5

The following text is from Billie Jean King's 2021 autobiography *All In*.
[P]eople on both sides of my family had repeatedly <u>demonstrated</u> an independent streak. In the end, that was the temperament I gravitated toward, too. Both the Moffitts and the members of my mother's clan, the Jermans, came from mining and oil-geyser towns on the western frontier. They kept their heads down and worked, worked, worked. But they also bucked convention.

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

A) Protested

B) Defined

C) **Exhibited**

D) Confirmed

Question 6

The following text is from Louise Erdrich's 1986 novel *The Beet Queen*. Celestine takes her infant daughter with her to the butcher shop where she makes sausages.

Sometimes Celestine turned around and met the direct gaze of her daughter, a look so penetrating that Celestine's breath caught. She dropped the spice, the string, the knife she was using, and took the girl up in her arms, ready for her to speak as if a spell had suddenly lifted.

When the baby flexed her entire body and struggled to free herself, Celestine put her down. No matter how thorough Celestine's exhaustion, no matter how little sleep she'd had, there was a nerve of excitement running through each hour.

©1986 by Louise Erdrich

Which choice best states the main purpose of the text?

A) To portray Celestine's excitement about her daughter

B) To show that Celestine enjoys imagining her daughter's future life

C) To detail how Celestine's coworkers express affection for her daughter

D) To establish Celestine's unhappiness with her job

Question 7

In the late 1880s, Ida B. Wells-Barnett began her journalism career and served as a newspaper editor and civil rights activist. Wells-Barnett's accomplishment is just one example of the rich history of Black journalism in the United States. That history is preserved by the National Association of Black Journalists, which was founded in Washington, DC, in 1975 to support Black media professionals and honor people like Wells-Barnett.

Which choice best describes the overall structure of the text?

A) It summarizes a theory about journalism, then explains how a journalistic practice has changed over time.

B) It mentions a specific achievement in Black journalistic history, then describes an organization dedicated to upholding that history.

C) It describes the career of a well-known figure in Black journalism, then compares that career to one of a figure who is lesser known.

D) It introduces the history of an organization honoring Black journalists, then suggests how that organization might recruit more members.

Question 8

Though Vasily Grossman's novel *Stalingrad* is considered inferior to his later work *Life and Fate,* some critics praise it despite an arduous writing process required to satisfy Soviet censors (Aaron Lake Smith in *Harper's Magazine* called *Stalingrad* "an accomplished historical war novel"). Of the novel's eleven drafts, the first is largely illegible, the sixth closely hews to Soviet orthodoxy, and published versions most resemble the fifth. The English edition's translators culled material from unpublished drafts and published Russian versions to create a comprehensive edition.

Which choice best describes the overall structure of the text?

A) **It notes a novel's critical reception, addresses the complicated history of the novel's development, and suggests how that history informed the work of the novel's English translators.**

B) It refers to a novel that has several different published and unpublished versions, identifies characteristics that have led critics to prefer one version to others, and tells how translators justified their choice to bring one particular version of the novel into another language.

C) It describes a novel whose critical reputation has declined over time, explains the cause of that decline, and reports the effort of translators to rehabilitate a work they believe has been unjustly ignored.

D) It mentions a novel whose quality critics do not agree on, discusses obstacles that make it difficult to determine what the best version of that novel might be, and offers a reason why some critics find a translation of the novel to be superior to the original.

Question 9

Vehicle drivetrains and many other widely used mechanical systems have moving parts that rub or slide against one another, creating friction. This friction increases energy consumption and causes wear, which decreases the stability and life span of the system. Using carbon nanotubes and oil, Jun Qu and colleagues at a US Department of Energy lab have created a coating for moving parts that reduces friction to the point where it is almost nonexistent. The new coating is suitable for common applications, unlike other approaches that require special conditions.

What does the text most strongly suggest about the coating created by Qu and colleagues?

A) It is unlikely to be widely used because it can be applied only under special conditions.

B) It is unlikely to reduce wear in mechanical systems that have multiple moving parts.

C) **It can likely be used to reduce energy consumption and wear in vehicle drivetrains and other common mechanical systems.**

D) It can likely improve the energy consumption of certain mechanical systems but not of vehicle drivetrains.

Question 10

Optimal foraging theory (OFT) holds that animals' foraging behaviors reflect cost-benefit trade-offs that vary by species and with dynamic ecological circumstances. One such circumstance is lunar intensity, which W.J. Cresswell and Stephen Harris found to be negatively associated with foraging by European badgers but Deborah J. Curtis and colleagues found to be positively associated with foraging by mongoose lemurs. This discrepancy is explicable in terms of OFT: the lemurs' greater reliance on vision means that higher lunar intensity benefits them more than it benefits the badgers.

Information in the text best supports which statement about OFT?

A) It tends to allow for a better understanding of the benefits of ecological circumstances than the costs of those circumstances.

B) It can explain why some species act in accordance with cost-benefit trade-offs and others do not.

C) **It can account for observations of different species responding differently to similar ecological circumstances.**

D) It may be weakened by the finding that the costs and benefits associated with a particular ecological circumstance vary by species.

High-speed rail (HSR) systems have trains that move at much higher speeds than traditional trains. HSR is expanding in the United Kingdom, Poland, and many other countries around the world. The United States, however, has been slow to build HSR systems. Researchers surveyed United States residents about their attitudes toward HSR. <u>The researchers claim that this survey reveals that there is strong support for building more HSR lines in the United States.</u>

Which quotation from a survey respondent would best illustrate the underlined claim?

A) "I prefer riding buses instead of taking trains because buses travel to more locations."

B) "I believe that the United States has enough high-speed rail lines. It should invest in airports instead."

C) **"I think high-speed rail is wonderful. The United States needs to build more high-speed rail lines."**

D) "I have traveled on high-speed rail lines in the United Kingdom but not in Poland."

Question 12

Numbers of the 23 Non-native Tree Species Reported and the Insect and Fungus Threats to Them

Country	Trees	Fungi	Insects
Italy	14	57	42
Ireland	7	14	6
Poland	10	25	105

Elisabeth Pötzelsberger and colleagues gathered data on 23 non-native tree species grown in Europe. They analyzed reports from Italy, Poland, and Ireland about the number of these species grown in those countries as well as the numbers of insect and fungus species that damage those trees. The researchers concluded that Italy had a greater number of damaging fungus species than either of the other countries did.

Which choice best describes data from the table that support Pötzelsberger and colleagues' conclusion?

A) Ireland reported 14 damaging fungus species but only 6 damaging insect species.

B) **Italy reported 57 damaging fungus species, which is more than either Poland or Ireland reported.**

C) Italy reported 57 damaging fungus species, whereas Poland reported 105 damaging insect species.

D) Poland and Ireland reported 10 and 7 damaging fungus species, respectively, which is far fewer than Italy reported.

Life Among the Paiutes is an 1882 autobiographical narrative by Sarah Winnemucca Hopkins. In the work, Winnemucca explicitly indicates when and how she is shifting the focus of the narrative, as when she writes, _ _ _ _ _ _ blank

Which quotation from *Life Among the Paiutes* most effectively illustrates the claim?

A) **"I will now stop writing about myself and family and tribe customs, and tell about the wars, and the causes of the wars. I will jump over about six years."**

B) "But how can I describe the scene that followed? Some of you, dear readers, can imagine."

C) "Oh, dear readers, these soldiers had gone only sixty miles away to Muddy Lake, where my people were then living and fishing."

D) "The day we were to start we partook of the first gathering of food for that summer. So that morning everybody prayed, and sang songs, and danced, and ate before starting."

Question 14

Average Ratings of Perceived Personality Traits of Dogs and Human Willingness to Keep or Interact with Them

Image ID number	Irises	Not friendly (0)– Friendly (5)	Immature (0)– Mature (5)	Would not keep (0)– Would keep (3)	Would not interact with (0)– Would interact with (3)
20	light	2.08	4.06	1.5	1.75
16	light	1.61	3.64	1.3	1.6
6	dark	4.03	2.95	1.85	2.15
2	dark	3.46	2.74	1.85	2.45

Studies have found that when looking at other people's eyes, humans tend to perceive dilated pupils positively and constricted pupils negatively. Noting that a dark iris—the colored portion surrounding the pupil—is hard to distinguish from the black of the pupil (and thereby affects the pupil's apparent size) and that many domestic dogs have dark irises, Akitsugu Konno et al. showed close-up images of dogs' faces to human participants and asked them to rate the dogs' traits and their own attitudes toward the dogs. Their findings suggest that _ _ _ _ _ _ blank

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

A) humans may not be as sensitive to pupil size in dogs as they are to pupil size in other people, as participants' responses to the images show no relationship to differences in the shade of dogs' irises that could affect how large the dogs' pupils appear to be.

B) differences in dogs' pupil size may elicit a stronger response in humans than differences in people's pupil size do, as participants' responses to the images when dogs' pupils were actually large were indistinguishable from participants' responses when dogs' pupils only appeared to be large due to iris color.

C) iris color in domestic dogs may be an adaptation to elicit positive responses from humans, as participants responded more negatively to images of dogs whose iris colors can make pupils appear large than they did to images of dogs without such iris colors.

D) humans' responses to pupil size in other people may extend to dogs, as participants responded more positively to images of dogs whose iris colors were likely to make their pupils appear large than they did to images of dogs whose iris colors were unlikely to have that effect.

Question 15

The red-vented bulbul and other fruit-eating bird species introduced to the Hawaiian island of Oahu in the last 150 years have recently been found to spread seeds from the fruits of forest plants native to Oahu that are at risk of extinction, such as the kolea lau nui tree. Many of these vulnerable plant species rely on the activity of fruit-eating birds to help spread the plants' seeds in the wild. All fruit-eating bird species native to Oahu have gone extinct, suggesting that _ _ _ _ _ _ blank

Which choice most logically completes the text?

A) non-native birds, such as the red-vented bulbul, now spread more seeds from the kolea lau nui tree than birds native to Oahu did in the past.

B) populations of red-vented bulbuls and other non-native birds will probably soon experience rapid growth.

C) red-vented bulbuls and other non-native birds play an important role that used to be filled by birds that were native to Oahu.

D) non-native birds, such as the red-vented bulbul, will also be at risk of extinction if they lose access to kolea lau nui trees.

Question 16

Laurence Engel is the director of the National Library of France in Paris. In this role, Engel _ _ _ _ _ _ blank the library's collections, which feature a large number of manuscripts by renowned French writers.

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

A) having overseen

B) overseeing

C) oversees

D) to oversee

Question 17

The epic poem *The Ramakien* dates back to the 17th century. Originally _____ blank in Thai, it has since been translated into other languages.

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

A) is written

B) written

C) had been written

D) was written

Question 18

Though it was designated as mission _____ blank mission was actually the ninety-seventh flight under NASA's Space Shuttle Program.

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

A) STS-99. The

B) STS-99, and the

C) STS-99, the

D) STS-99 the

Question 19

The grammar of the Chuvash language includes several noun cases common to most Turkic _____ blank the locative case, for instance, indicates that an action is occurring at, on, or near a particular noun.

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

A) languages,

B) languages; such as

C) languages;

D) languages, such as

Question 20

The radial velocity method, a means of indirect planetary discovery, has detected previously unknown exoplanets at vast distances from _____ blank the gas giant 47 Ursae Majoris b; at 69 light-years away, the gas giant 16 Cygni B b; and, as of 2023, over 1,000 other exoplanets that are too far away and dim to be observed directly.

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

A) Earth: at 45 light-years away,

B) Earth at 45 light-years away,

C) Earth, at 45 light-years away,

D) Earth at 45 light-years away:

Question 21

Phillip Huber is well known for his work as a puppeteer. _____ blank he specializes in marionette puppetry. This style of puppetry involves controlling the puppet with strings from above.

Which choice completes the text with the most logical transition?

A) By doing so,

B) Second,

C) By contrast,

D) **In particular,**

Question 22

Unlike standard Western maps, which privileged static features like coastlines, the Marshallese stick charts used by Pacific Islands navigators for centuries depicted fluctuating ocean dynamics, such as ocean swells, through intricate lattice-like constructions of wood, fibers, and shells. _____ blank these stick charts were memorized prior to a voyage rather than consulted at sea.

Which choice completes the text with the most logical transition?

A) Even so,

B) **Moreover,**

C) Subsequently,

D) However,

Question 23

Portuguese researcher Isabel C.F.R. Ferreira reports that the gentisic acid in almond mushrooms benefits the mushroom by combating harmful molecules called free radicals. _____ blank Ferreira suggests that the acid can promote cellular health in humans, who also experience free radical damage.

Which choice completes the text with the most logical transition?

A) Rather,

B) **Moreover,**

C) Conversely,

D) For example,

Question 24

In economics, wool is considered a soft commodity, while copper and crude oil are considered hard commodities. The categorical distinction between soft and hard commodities lies not in the products' strength or durability but in their origin: the former type is grown or farmed, while the latter is mined or drilled. _____ blank pine lumber is as much a soft commodity as wool, despite its decidedly sturdier composition.

Which choice completes the text with the most logical transition?

A) Though it is grown from the earth,

B) Summarizing this principle,

C) **By this definition,**

D) In a notable exception to this rule,

Question 25

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

- A copyright prevents a book's contents from being reproduced (published) without permission from the copyright holder.
- When a book's copyright expires, the book enters the public domain and can be legally reproduced by anyone.
- *When We Were Very Young* is a children's book by A.A. Milne.
- It entered the public domain in 2020.
- *Mrs. Dalloway* is a novel by Virginia Woolf.
- It entered the public domain in 2021.

The student wants to emphasize the order in which *When We Were Very Young* and *Mrs. Dalloway* entered the public domain. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) ***When We Were Very Young*, a children's book by A.A. Milne, entered the public domain in 2020, with Virginia Woolf's novel *Mrs. Dalloway* following in 2021.**

B) The year was 2021, and the copyrights to *When We Were Very Young* and *Mrs. Dalloway* had finally expired.

C) *When We Were Very Young*, a children's book by A.A. Milne, and *Mrs. Dalloway*, a novel by Virginia Woolf, are both in the public domain.

D) Though they once were copyrighted works, *When We Were Very Young* and *Mrs. Dalloway* are now in the public domain.

Question 26

While researching a topic, a student has taken the following notes:
- The A.M. Turing Award is a prestigious award given by the Association for Computing Machinery (ACM).
- The ACM gives the award for "major contributions of lasting importance to computing."
- It is named after groundbreaking British mathematician Alan Turing.
- Edgar F. Codd won the award in 1981 for contributions to the development of database management systems.

The student wants to explain whom the award is named for. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) The A.M. Turing Award is given for "major contributions of lasting importance to computing."

B) **The A.M. Turing Award is named for groundbreaking British mathematician Alan Turing.**

C) It was in 1981 that Edgar F. Codd won the A.M. Turing Award.

D) In 1981, Edgar F. Codd won the A.M. Turing Award for contributions to the development of database management systems.

Question 27

While researching a topic, a student has taken the following notes:
- Mary Gaitskill is an acclaimed writer.
- Her first published work of fiction was a short story.
- It was called "Something Better Than This."
- It first appeared in *Branching Out* in 1978.

The student wants to identify the title of Mary Gaitskill's first published short story. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) In 1978, a short story by Mary Gaitskill appeared in *Branching Out*.

B) Mary Gaitskill's first published work of fiction appeared in 1978.

C) **Mary Gaitskill's first published short story was called "Something Better Than This."**

D) Acclaimed writer Mary Gaitskill's first published work of fiction was a short story.

Section 1, Module 2: Reading and Writing

Ella Katz and colleagues _ _ _ _ _ _ blank pots of sterilized soil with slurries of live microbes collected from soil in five sites across Colorado, including areas of ponderosa pine forest and dry pasture. Katz and team then grew mustard plants in the pots to see if the different microbial slurries affected levels of spicy glucosinolates like 3-methylthiopropyl in the plants' seeds.

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

A) sanitized

B) populated

C) estimated

D) precluded

The following text is adapted from John Matheus's 1926 short story, "Mr. Bradford Teaches Sunday School." Mr. Bradford is driving through the countryside in Florida.

The moss in the towering water oaks had become enlivened with a verdant sheen of silver and hung like festoons of carnival or like funeral decorations for the mourning of the dead. The pine green was resplendent. The bald cypresses spread themselves along the water courses while the willows wept as they always did. Mr. Bradford was conscious of this gorgeous <u>display</u> of nature.

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

A) Spectacle

B) Pretentiousness

C) Imitation

D) Trickery

Question 3

As a work of scholarship, *Advancing U.S. Latino Entrepreneurship* (2020) is notable for its _ _ _ _ _ _ blank. Featuring contributions from Monika Mantilla, Kathleen Stewart, and others, it explores contemporary issues while also providing context dating all the way back to the sixteenth century on Latino populations and their experiences with business and commerce.

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

A) impartiality

B) terseness

C) **scope**

D) reputation

Question 4

The _ _ _ _ _ _ blank of leaf-vein architectures—the branching venation of *Pteris cretica*, the hierarchical netlike venation of *Salix pedicellaris*, and others—likely resulted from competing selective pressures to maximize fluid transport, photosynthesis, and robustness against herbivory. The associated trade-offs may account for the range of adaptations in different lineages.

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

A) culpability

B) **multifariousness**

C) obstinacy

D) entanglement

Question 5

Emerging bioacoustics technologies have _____ blank long-standing challenges to wildlife research by enabling scientific observation without a human presence in the field. For example, these tools have been used for continuous, unattended monitoring of insect species and for tracking nocturnal birds when they move into inaccessible areas of wetlands where traditional observation methods fail.

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

A) attributed

B) underpinned

C) surmounted

D) subjugated

Question 6

Human taste receptors contain TRMP5 channels, which affect how sweet or bitter, among other flavors, things are. These channels are most active at high temperatures, conferring the greatest effect for food that is consumed hot. Conversely, for foods eaten cold (particularly below 59°F), these channels are less active and confer less flavor; thus, something like ice cream containing large amounts of sugar will taste as intended when eaten cold but may become cloyingly sweet once it melts.

Which choice best states the main purpose of the text?

A) To suggest changes to the formulations of some foods to account for the temperatures at which they are meant to be consumed

B) To explain how discoveries related to taste receptors might influence the temperatures at which foods are typically consumed

C) To discuss how particular temperature-sensitive structures affect perceptions of flavor

D) To indicate why some flavors are consistently more prominent than others across a range of temperatures

The metal featured in both the structure of the House in Kamiaraya by Kazuto Nishi Architects and the hardware in the House in Takamatsu by FujiwaraMuro Architects is representative of a trend in contemporary Japanese interior design to juxtapose sleek, modern accents with traditional organic materials such as paper. The prominent featuring of metal stems from the post–World War II emphasis on technological progress, while more traditional natural materials help preserve longstanding architectural and aesthetic approaches.

Which choice best describes the overall structure of the text?

A) **The text cites examples of a design trend and then briefly establishes the principles underlying the trend.**

B) The text distinguishes between two aesthetic approaches to architecture and then submits that one approach has had more of a long-term impact than the other has had.

C) The text names projects that are noteworthy for their inclusion of certain materials and then explains past important uses of the materials.

D) The text introduces the salient characteristics of two buildings and then details the historical events that occasioned the buildings' designs.

Question 8

Text 1

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

Text 2

Fernandez 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.

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

A) A barrier that is impervious to both roots and fungal strands is necessary to examine nutrient transfer via a CMN.

B) Wahbi and colleagues' study did not find convincing evidence of nutrient transfer between individual plants.

C) **It is impossible to determine whether a CMN is the mechanism for any observed nutrient transfer unless root-to-root transfer is precluded.**

D) Excluding root-to-root transfer of nutrients between plants is sufficient to evaluate whether any observed nutrient transfer involved a CMN.

Mauricio Drelichman and Hans-Joachim Voth's research into the debt defaults of Philip II (who ruled an empire including Spain and Northern Catalonia from 1556 to 1598) relates to other work on European early modern state finance, including John Brewer's research on taxation and warfare. But Drelichman and Voth's unique contribution to the field is their reconstruction of the earliest extant set of annual fiscal records for any sovereign state, demonstrating in turn that Philip's defaults were caused by short-term cash shortages, not long-term unsustainable debts.

Which choice best states the main idea of the text?

A) Drelichman and Voth's research on Philip II's debt defaults builds on earlier work by Brewer, adding nuance to the earlier work's findings.

B) Analysis of the earliest available records of a sovereign state's finances can be found not in the work of Brewer but in that of Drelichman and Voth.

C) **Drelichman and Voth advanced the field of research on European early modern state finance by assembling a novel collection of evidence that gave them insight into Philip II's debt defaults.**

D) The research by Drelichman and Voth suggests that the logistics of ruling both Spain and Northern Catalonia led to short-term problems with cash that forced Philip II to default on his debts.

Average Overlap between
Immature Orangutans'
Diets (ID) and Their Mothers'
Diets (MD)

% of diet

90
80
70
60
50
40
30
20
10
0

MD shared with ID

ID not shared with MD
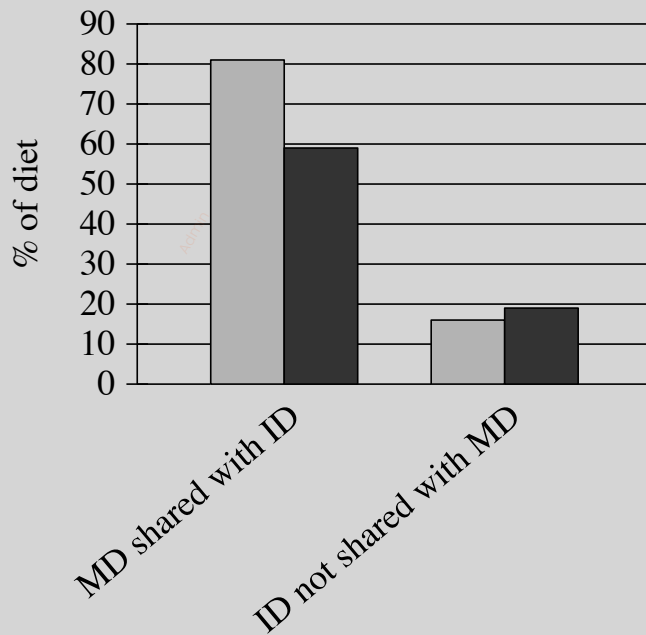
□ individual 9 (female)
■ individual 17 (male)

- For each data category, the following bars are shown:
  - individual 9 (female)
  - individual 17 (male)
- The % of diet data for the 2 categories are as follows:
  - MD shared with ID:
    - individual 9 (female): 81%
    - individual 17 (male): 59%
  - ID not shared with MD:
    - individual 9 (female): 16%
    - individual 17 (male): 19%

Male orangutans typically disperse from the territory in which they were born when they reach maturity, whereas females typically do not. Beatrice Ehmann and her colleagues hypothesized that this difference in life trajectory should be reflected in the diets of immature orangutans: males should share fewer of their mothers' dietary preferences than females do since those preferences tend to be particular to the food resources available in the local area and may be of relatively low utility beyond it. The researchers calculated the percent of mother orangutans' diets shared with their offspring's diets and the percent of immature orangutans' diets not shared with their mothers' diets.

Which choice best describes data from the graph that support Ehmann and colleagues' hypothesis?

A) The percent of individual 9's mother's diet that was shared with individual 9's diet ranged from approximately 59% to approximately 81%, whereas the percent of individual 17's mother's diet that was shared with individual 17's diet ranged from approximately 16% to approximately 19%.

B) Neither individual 17 nor individual 9 had a diet that consisted mostly of food not shared with the individual's mother's diet, whereas more than half of both individuals' mothers' diets were shared with their offspring's diets.

C) The majority of the diet of the mother of individual 9 was shared with the diet of individual 9, whereas significantly less than half the diet of the mother of individual 17 was shared with the diet of individual 17.

D) **The percent of the mother's diet shared with its offspring's diet was smaller for individual 17 than for individual 9, and the percent of the individual's diet not shared with its mother's diet was greater for individual 17 than for individual 9.**

Question 11

Broken-Wing Display in Various Bird Species

Species name	Common name	Order	Performs broken-wing display?
Bubo virginianus	great horned owl	Strigiformes	Yes
Callonetta leucophrys	ringed teal	Anseriformes	Yes
Actitis hypoleucos	common sandpiper	Charadriiformes	Yes
Calidris maritima	purple sandpiper	Charadriiformes	No
Zenaida meloda	West Peruvian dove	Columbiformes	No

While observing birds for a biology class, a group of students noticed a greater painted-snipe (*Rostratula benghalensis*), a bird of the order Charadriiformes (shorebirds), slowly move away, make loud noises, and feign an injured wing as the group approached the bird's ground nest. Researching this behavior, the students learned that this phenomenon is commonly referred to as "broken-wing display" and is meant to lure predators away from the nesting site and toward a seemingly vulnerable adult bird. Upon learning of other birds that also exhibit the behavior they had observed, the students hypothesized that the phenomenon is exclusive to shorebirds.

Which choice best describes data from the table that weaken the students' claim?

A) **Both the great horned owl and the ringed teal are known to perform broken-wing display.**

B) The common sandpiper, in the order Charadriiformes, is known to perform broken-wing display, and the West Peruvian dove, in the order Columbiformes, is not.

C) Neither the West Peruvian dove nor the purple sandpiper is known to perform broken-wing display.

D) Unlike the common sandpiper, the purple sandpiper is not known to perform broken-wing display, even though both are in the order Charadriiformes.

Question 12

The bird species *Monasa atra* (the black nunbird) practices a foraging strategy known as sallying (catching insects in flight and returning to a perch to eat them), enabling it to scan for prey and predators simultaneously. Conversely, *Myrmotherula axillaris* (the white-flanked antwren), with which *M. atra* shares territory in French Guiana, practices foliage gleaning (picking insects off leaves), substantially limiting the bird's field of vision while foraging. Biologist Ari Martínez and colleagues hypothesized that the greater vulnerability inherent in the latter strategy is reflected in greater sensitivity to predator warning signals from neighboring species.

Which finding, if true, would most directly support Martínez and colleagues' hypothesis?

A) **When Martínez and colleagues played alarm calls from another local bird species, *M. axillaris* displayed predator-avoidance behavior, whereas *M. atra* did not display any behavioral change.**

B) When Martínez and colleagues played *M. atra* alarm calls, only *M. atra* displayed predator-avoidance behavior, whereas both *M. atra* and *M. axillaris* displayed such behavior when *M. axillaris* alarm calls were played.

C) When Martínez and colleagues played control sounds of random noise, only *M. axillaris* displayed predator-avoidance behavior, whereas both *M. axillaris* and *M. atra* displayed such behavior when alarm calls from another local bird species were played.

D) When Martínez and colleagues played alarm calls from a species that does not share territory with *M. atra* and *M. axillaris*, *M. atra* displayed predator-avoidance behavior, whereas *M. axillaris* did not display any behavioral change.

The Czech Republic, which, according to international indices, has relatively strong democratic institutions and low intranational income inequality, experienced an inflation rate of 2.84% in 2019, whereas Bahrain, which shows the opposite pattern on such indices, had an inflation rate of only 1.00% that year. Such a comparison may seem consistent with the theoretical critique that by diluting control over the economy, democratic institutions inhibit states' ability to counteract inflationary pressures, but when Raj Desai et al. examined democratic strength, intranational inequality, and inflation in more than 100 countries, they found that democratic strength, if associated with low inequality, restrains inflationary pressures, which would suggest that _ _ _ _ _ _ blank

Which choice most logically completes the text?

A) the 2019 difference between the Czech Republic's inflation rate and Bahrain's inflation rate is primarily but not exclusively attributable to the different levels of intranational income inequality in the two countries.

B) inflation in the Czech Republic in 2019 would have been higher if the Czech Republic's government had less control over the economy.

C) **factors other than the Czech Republic's political structure contributed to the country's inflation rate exceeding that of Bahrain in 2019.**

D) international indices may have underestimated the strength of the Czech Republic's democratic institutions relative to Bahrain's.

Natural monuments and other types of protected areas (PAs) are established to promote conservation, but because they restrict certain economic activities, it is widely believed that they hinder local economic development. However, a study by Anubhab Gupta and team investigating five PAs, including Lower Zambezi National Park (a terrestrial PA in Zambia) and Abrolhos Marine Park (a marine PA in Brazil), estimated the impact of tourism on these regions and concluded that tourism likely results in increased household incomes in local communities. But whereas terrestrial PAs were in remote places with few alternative amenities to attract tourists, marine PAs were close to additional amenities not part of the PA. Thus, the researchers conceded that although _ _ _ _ _ _ blank

Which choice most logically completes the text?

A) the establishment of both PAs likely benefited their respective local economies, such gains likely derived mainly from the tourism industry in Lower Zambezi and from industries unrelated to tourism in Abrolhos.

B) **economic activity in the tourism sector in communities around Lower Zambezi can likely be attributed to interest in it as a protected area, economic activity in tourism around Abrolhos may be unrelated to the PA.**

C) tourism at Abrolhos and surrounding regions likely fluctuated erratically in the period shortly after the PA was created, tourism at Lower Zambezi remained largely stable.

D) household income increased in the areas surrounding both PAs, it likely grew at a much faster rate for households near Abrolhos than for households near Lower Zambezi.

The subscription economy has rapidly expanded to include a wide range of products—from books to video gaming services—in part because consumers appreciate the convenience of automatic payments. But as a study by Liran Einav and team shows, consumers are typically inattentive to automatic payments and remain subscribed to services long after their value has worn off. The study also found that subscribers were much more likely to discontinue a service when they had to make an active renewal decision (for example, when they need to update payment information to remain subscribed) than at other times. The researchers therefore concluded that a regulation requiring all subscribers to complete payments manually would likely _____ blank

Which choice most logically completes the text?

A) deter attentive consumers from subscribing in the first place but would have little effect on whether inattentive consumers decide to subscribe.

B) decrease subscribers' valuation of the subscription services at a faster rate than if no such regulation were implemented.

C) result in reduced average subscription durations, but the overall experience of the longest-subscribing consumers would improve.

D) **enable dissatisfied subscribers to save more money than they would without such a regulation in place but at the expense of a feature that may have induced them to subscribe initially.**

Should the US cut taxes? As of 2017, the US's top tax rate (48%) was lower than the highest point on the country's Laffer curve. A theoretical relationship between tax rates and revenues, the curve can be used to determine whether tax cuts will ultimately increase a country's tax revenue, according to some _____ blank 2017 data suggested that the US was below the threshold for a tax cut.

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

A) economists; as the

B) economists. The

C) economists the

D) **economists, the**

Breaking ties with the Soviet Union in 1991 catalyzed a host of infrastructural changes for the newly independent Tajikistan, among them a new country dialing code from the International Telegraph and Telephone Consultative Committee _ _ _ _ _ _ blank incoming international telephone calls to reach the country.

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

A) enabled

B) **enabling**

C) had enabled

D) would enable

Some places that were once part of the Spanish Empire, such as the Netherlands, reveal few traces of a past connection to Spain, linguistic or otherwise. In contrast, Panama broke free from the Spanish Empire in the nineteenth century yet still bears its imperial history in its language, Spanish _ _ _ _ _ _ blank spoken by most current residents of Panama.

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

A) is being

B) **being**

C) will be

D) is

A single specimen of *N. vivans,* collected at a depth of 129 fathoms (236 meters) in the Indian Ocean, and a single specimen of *P. obliquiloculata,* collected at a depth of 260 fathoms (475 meters) in the South Atlantic, have been preserved as exemplars of their respective _ _ _ _ _ _ blank former in a repository at Washington, DC's Museum of Natural History and the latter in a repository at London's Natural History Museum.

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

A) species; the

B) **species, the**

C) species, and the

D) species. The

Located on the Ijssel River in the Netherlands, the city of Zutphen was a member of a powerful mercantile alliance that dominated northern European trade between the 13th and 17th _ _ _ _ _ _ blank a loose confederation of cities from eleven modern-day countries, it has been described as a precursor to today's European Union.

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

A) centuries: the Hanseatic League,

B) centuries—the Hanseatic League;

C) **centuries, the Hanseatic League,**

D) centuries; the Hanseatic League,

Question 21

Marisa Parham of Amherst College, along with researchers Joyce Jackson of Louisiana State University and Christina Zanfagna of Santa Clara University, _ _ _ _ _ _ blank on the advisory team for the Timeline of African American Music, an interactive digital resource that explores African American musical history from the 1600s to the present day.

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

A) have served

B) are serving

C) serve

D) **serves**

Question 22

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, Vermont's Tunbridge soil was formally designated in 1985, and Oregon's Jory soil in 2011. _ _ _ _ _ _ blank 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) Similarly,

B) Indeed,

C) **In many cases,**

D) Therefore,

Question 23

Although the Sino-Tibetan language of Baragaon has only about 7,500 living speakers, most in Nepal, the New York City–based Endangered Language Alliance has identified a group of Baragaon speakers in the city's borough of Queens. _____ blank in the borough's Richmond Hill neighborhood, these speakers are both helping to ensure Baragaon's survival and contributing to the city's unmatched linguistic diversity.

Which choice completes the text with the most logical transition?

A) Consequently,

B) There,

C) For example,

D) Likewise,

Question 24

James Warren employed the pseudonym "Helvidius Priscus"—the name of an ancient Roman philosopher—in political essays he wrote in 1787, a choice that accomplished far more than simply concealing his authorship. _____ blank it wasn't an arbitrary pen name but rather a complex rhetorical strategy through which Warren aligned his anti-federalist views with the venerated republican ideals of the ancient world, thereby bolstering the authority of his writing.

Which choice completes the text with the most logical transition?

A) Indeed,

B) Conversely,

C) In addition,

D) However,

Question 25

While researching a topic, a student has taken the following notes:
- A U-shaped curve in a river channel is called a meander.
- A meander forms when water erodes sediment from one side of the riverbank and redeposits that sediment on the opposite side.
- Meanders will gradually change shape and migrate downstream over time.
- A river with high sinuosity has many meanders, and a river with low sinuosity has few.
- The Fort Nelson River in Canada has high sinuosity.

The student wants to describe how meanders are formed. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) The U-shaped curves, or meanders, that form in a river will gradually change shape and migrate downstream.

B) Over time, many meanders have formed in the Fort Nelson River, a river in Canada with high sinuosity.

C) A high-sinuosity river, the Fort Nelson River has many meanders that will change shape and shift downstream over time.

D) **Over time, water erodes sediment from one side of a riverbank and redeposits it on the other, resulting in a U-shaped curve, or meander, in the river channel.**

Question 26

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

- Gabriel de Vallseca was a fifteenth-century Majorcan cartographer of portolan charts.
- Battista Beccario was a fifteenth-century Genoese cartographer of portolan charts.
- Portolan charts were early nautical charts that mapped the waterways of the Mediterranean and Black Seas.
- Portolan charts in the Genoese tradition tended to be sparse in illustrations.
- Those in the Majorcan tradition tended to be richly illustrated.
- In Majorcan charts, Bohemia is depicted as a horseshoe, and the Tagus River is depicted as a shepherd's crook.

The student wants to make a distinction between the two portolan traditions. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) While portolan charts in the Majorcan tradition tended to be richly illustrated, those in the Genoese tradition mapped the waterways of the Mediterranean and Black Seas.

B) Unlike Genoese portolan charts, which could include illustrations of horseshoes and shepherds' crooks, Majorcan charts were sparse in illustration.

C) Being in the Majorcan tradition, the portolan charts of Gabriel de Vallseca differed from those of the Genoese cartographer Battista Beccario.

D) **Majorcan portolan charts, unlike their sparser Genoese counterparts, tended to be richly illustrated.**

Question 27

While researching a topic, a student has taken the following notes:
- Artistic works made readily accessible to the general public are categorized as public art.
- Artist Marco Cianfanelli's metal sculpture *Release* is on display at a public memorial in Howick, South Africa.
- This work of public art depicts the first democratically elected president of South Africa, Nelson Mandela.
- Artist Claes Oldenburg's forty-five-foot-tall steel sculpture *Clothespin* is on display in a public square in Philadelphia, Pennsylvania.
- This work of public art depicts a giant clothespin standing on its end.

The student wants to contrast the two sculptures. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) *Release* by Cianfanelli and *Clothespin* by Oldenburg are two examples of public art.

B) Oldenburg's sculpture *Clothespin*, which depicts a giant clothespin standing on its end, is on display in Philadelphia, Pennsylvania.

C) Cianfanelli's *Release*, unlike Oldenburg's *Clothespin*, depicts a human subject.

D) In contrast to Cianfanelli's *Release*, Oldenburg's *Clothespin* is displayed in a public place.

Section 2, Module 1: Math

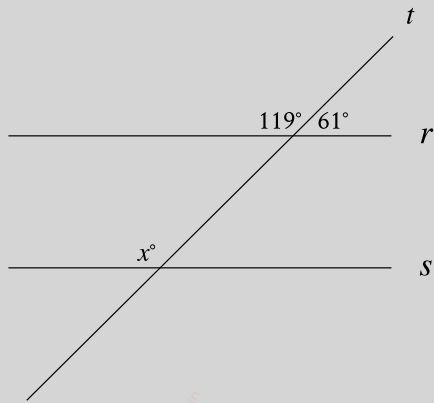**Question 1**

Which expression is equivalent to $v^4 - 350v^3$?

A) $(v^2 + 35)(v^2 - 10)$

B) $v^3(v - 350)$

C) $v^3(v + 350)$

D) $(v^2 - 35)(v^2 - 10)$

Note: Figure not drawn to scale.

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

A) 180

B) 90

C) 119

D) 29

The width of a rectangle is 6 centimeters. The length of the rectangle is 50 centimeters longer than the width. What is the area, in square centimeters, of this rectangle?
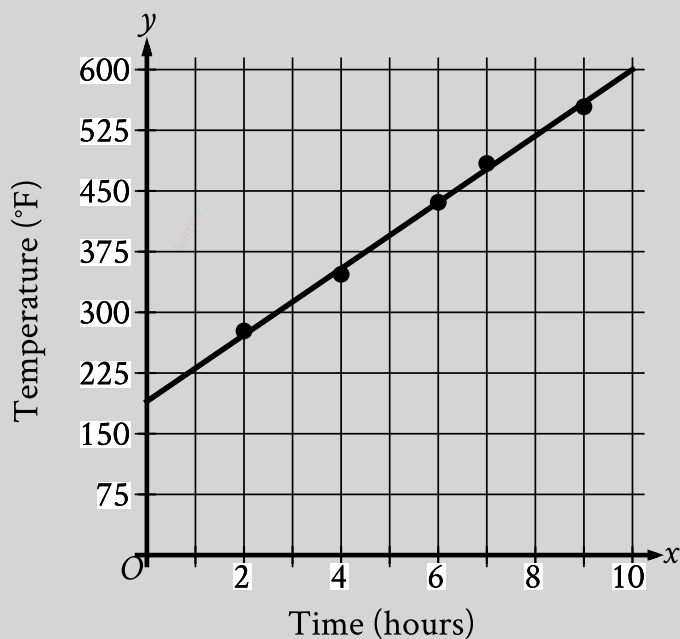
A) 6

B) 62

C) 336

D) 12

For the first 10 hours of an experiment, the scatterplot shows the temperature y, in degrees Fahrenheit ($^{\circ}$F), of an object at various times x, in hours, since the start of the experiment. A line of best fit is also shown.

Which of the following is the best interpretation of the slope of the line of best fit?

A) The predicted temperature decreases at a constant rate of approximately $190\,^{\circ}$F per hour over the 10-hour period.

B) The predicted temperature increases at a constant rate of approximately $190\,^{\circ}$F per hour over the 10-hour period.

C) The predicted temperature decreases at a constant rate of approximately $40\,^{\circ}$F per hour over the 10-hour period.

D) The predicted temperature increases at a constant rate of approximately $40\,^{\circ}$F per hour over the 10-hour period.
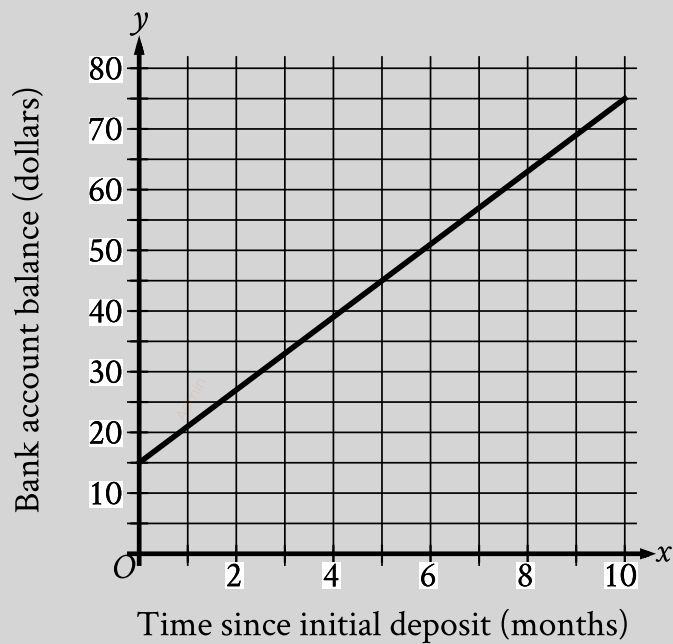
A bank account was opened with an initial deposit. Over the next several months, regular deposits were made into this account, and there were no withdrawals made during this time. The graph of the function f shown, where $y = f(x)$, estimates the account balance, in dollars, in this bank account x months since the initial deposit. To the nearest whole dollar, what is the amount of the initial deposit estimated by the graph?

Answer:

15

$$y = -17x + 26$$

$$y = -23x + 32$$

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

A) $(32, 26)$

B) $(26, 32)$

C) $(1, 9)$

D) $(9, 1)$

Question 7

$$f(x) = -16x^2 + 71$$

The function f gives the estimated height, in feet, of an acorn x seconds after the acorn fell from a tree. Based on the function, what is the estimated height, in feet, of the acorn before it fell from the tree?

Answer:

71

During hibernation, American black bears do not eat or replenish calories. A certain black bear weighed 493 pounds when entering hibernation and lost weight at a rate of 0.9 pound per day. At this rate, how many days after entering hibernation did the black bear weigh 430 pounds?

Answer:

70
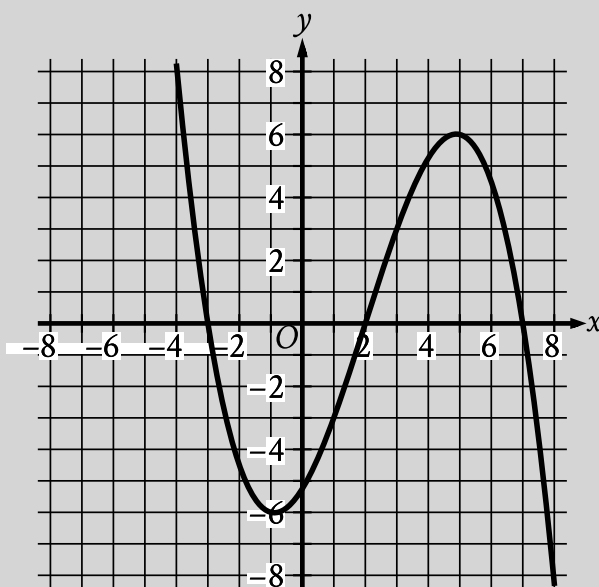
The graph of the polynomial function f is shown, where $y = f(x)$. What is the value of $f(7)$?

A) -3

B) 7

C) 0

D) 2

Rectangles S and R are similar. The ratio of each side length of rectangle S to the corresponding side length of rectangle R is 25 to 49. The ratio of the area of rectangle S to the area of rectangle R is 625 to r. What is the value of r?

Answer:

2401

A freight elevator can hold a maximum weight of $4{,}640$ pounds during one trip. A 160-pound person needs to deliver several boxes using the freight elevator. Some of these boxes weigh 22 pounds each and the others weigh 60 pounds each. Which inequality represents the possible combinations of the number of 22-pound boxes, x, and the number of 60-pound boxes, y, the person can deliver during one trip if only the person and the boxes are on the freight elevator?

A) $60x + 22y \leq 4{,}640$

B) $22x + 60y \geq 4{,}480$

C) $60x + 22y \geq 4{,}640$

D) $22x + 60y \leq 4{,}480$

Question 12

A quadratic function C models the coefficient of lift of a flying disc, where x is the angle of incidence, in degrees, and $30 \le x \le 45$. The function estimates that the maximum value of the coefficient of lift is 1.74, achieved when the angle of incidence is 41 degrees. Which equation could define C?
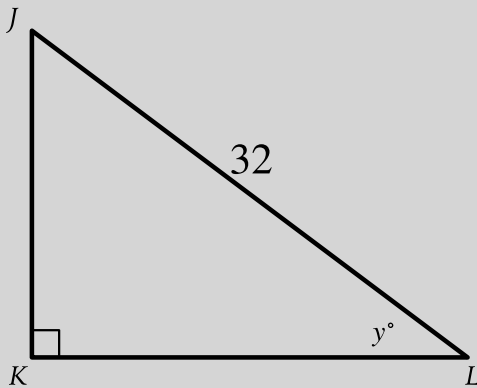
A) $C(x) = -0.005(x - 1.74)^2 + 41$

B) $C(x) = 0.005(x + 1.74)^2 + 41$

C) $C(x) = -0.005(x - 41)^2 + 1.74$

D) $C(x) = 0.005(x + 41)^2 + 1.74$

Question 13

Note: Figure not drawn to scale.

In triangle JKL, $\cos y° = \frac{31}{32}$. What is the length of $\overline{KL}$?

Answer:

31

$$b - 57 = \frac{x}{y}$$

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

A) $\quad x = by - 57y$

B) $\quad x = \frac{b-57}{y}$

C) $\quad x = by - 57$

D) $\quad x = \frac{by-57}{y}$

In the *xy*-plane, the graph of the linear function h contains the points $(0, 0)$ and $(1, 28)$. Which equation defines h, where $y = h(x)$?

A) $\quad h(x) = x + 28$

B) $\quad h(x) = \frac{1}{28}x + 28$

C) $\quad h(x) = 28x$

D) $\quad h(x) = 28x + 28$

$$3x + y = 21$$

$$9x - y = 3$$

How many solutions does the given system of equations have?

A) Exactly one

B) Zero

C) Infinitely many

D) Exactly two

The measure of angle K is $\frac{\pi}{3(17)}$ radians. The measure of angle L is 17 times the measure of angle K. What is the measure, in **degrees**, of angle L?

A) 17

B) 60

C) 77

D) 43

Question 18

$$\frac{(x-4)(x-8)}{x-1} = 0$$

What is the sum of the solutions to the given equation?

A) 13

B) 12

C) 8

D) 1

Question 19

What is the *y*-intercept of the graph of $y = 14^x + 20$ in the *xy*-plane?

A) $(0, 21)$

B) $(0, 20)$

C) $(0, 14)$

D) $(0, 34)$

Question 20

$$-2x + 14px = 42$$

In the given equation, p is a constant. The equation has no solution. What is the value of p?

A) $\frac{3}{2}$

B) 0

C) 3

D) $\frac{1}{7}$

Question 21

The density of a certain type of marble stone is 2.2000 grams per cubic centimeter. If a sample of this type of stone is in the shape of a sphere with a diameter of 33.000 centimeters, what is the mass of this sample, in grams, to the nearest whole number? (Use 3.14159 for π.)

Answer:

41396

Question 22

The function w is defined by $w(r) = \frac{1}{r-2} - \frac{r-9}{-r+5.25}$. What is the greatest possible value of r such that $w(r) = 0$?

Answer:

17/2

Question 1

Which expression is equivalent to $\left(3x^3 - 2x + 7\right) - \left(8x^6 + 6x - 6\right)$?

A) $-5x^9 - 8x - 13$

B) $-5x^9 - 4x + 1$

C) $-8x^6 + 3x^3 - 8x + 13$

D) $-8x^6 + 3x^3 + 4x + 1$

Question 2

What is the slope of the graph of $y = \frac{3}{17}x$ in the *xy*-plane?

A) $\frac{17}{3}$

B) $\frac{3}{17}$

C) 0

D) $-\frac{3}{17}$

$$34x + 83y = 370$$

The given equation represents the volume of mulch x, in cubic feet, and the volume of soil y, in cubic feet, in a mixture of mulch and soil that weighs 370 pounds. If the volume of soil in the mixture is 2 cubic feet, what is the volume of mulch in the mixture, in cubic feet?

Answer:

6

$$y < x$$

$$y > -3x - 6$$

For which of the following tables are all the values of x and their corresponding values of y solutions to the given system of inequalities?

A)

x	y
-10	-3
-9	-4
-8	-5

B)

x	y
-10	-14
-9	-13
-8	-12

C)

x	y
7	3
8	4
9	5

D)

x	y
7	12
8	11
9	10

$$f(x) = 6(g(x)) - 3$$

$$g(x) = |12x - 7|$$

The functions f and g are defined by the given equations. What is the value of $f(-10)$?

A) 763

B) 759

C) -63

D) 127

The population of a certain city doubled every 75 years from 1658 to 1958. The population of this city was $160,000$ in 1958. What was the population of this city in 1658?

Answer:

10000

Question 7

Line k is defined by $7x + 11y - 8 = 0$. Line j is perpendicular to line k in the *xy*-plane. What is the slope of line j?

A) $-\frac{11}{8}$

B) $\frac{8}{11}$

C) $\frac{11}{7}$

D) $-\frac{7}{11}$

Question 8

In the *xy*-plane, an equation of circle A is $(x - 4)^2 + (y - 3)^2 = 16$. Circle B has the same center as circle A but has a radius that is twice the radius of circle A. Which equation represents circle B?

A) $(x - 4)^2 + (y - 3)^2 = 128$

B) $(x - 4)^2 + (y - 3)^2 = 32$

C) $(x - 4)^2 + (y - 3)^2 = 64$

D) $(x - 4)^2 + (y - 3)^2 = 256$

The length of the diagonal of a square is $\frac{188\sqrt{2}}{2}$ units. What is the area, in square units, of the square?

A) 17,672

B) 376

C) 94

D) 8,836

Each of the following frequency tables represents a data set. Which data set has the greatest mean?

A)

Value	Frequency
50	7
60	6
70	6
80	7

B)

Value	Frequency
50	4
60	5
70	6
80	7

C)

Value	Frequency
50	6
60	6
70	6
80	6

D)

Value	Frequency
50	8
60	5
70	5
80	8

At the beginning of an experiment, the temperature of a liquid is 23 degrees Celsius ($^\circ$C). During the first 4.0 minutes of the experiment, the temperature of the liquid increases at an average rate of $7.5\,^\circ$C per minute. Then, the temperature of the liquid increases at a constant rate of $2.6\,^\circ$C per minute. If the temperature of the liquid reaches $61\,^\circ$C x minutes after the beginning of the experiment, where $x > 4.0$, which equation represents this situation?

A) $61 = 2.6x + 23$

B) $61 = 2.6(x - 4.0) + 30$

C) $61 = 2.6x + 53$

D) $61 = 2.6(x - 4.0) + 53$

A partially filled container containing 24 milliliters of water is placed under a leaky faucet that produces one 0.08-milliliter drop of water every 8 seconds. Until the container is full, which of the following can be used to represent the volume v, in milliliters, of water in the container t seconds after it is placed under the faucet, where t is a multiple of 8?

A) $v = 0.64t + 24$

B) $v = 0.01t + 24$

C) $v = 8t$

D) $v = 0.08t + 24$

Question 13

A science club from a certain high school in Ohio conducted an experiment to study the effects of smell on taste. A sample of 100 students was selected at random from the high school to participate in the experiment. First, the students tasted a pureed food sample while wearing covered goggles and nose plugs. Then, the students tasted the same pureed food sample without nose plugs. 30 students were able to correctly identify the pureed food sample while wearing nose plugs. Which of the following is the largest population to which the results of the experiment can be generalized?

A) All students from high schools in Ohio

B) The 30 students who were able to correctly identify the pureed food sample while wearing nose plugs

C) **All students from the high school**

D) The 100 students who participated in the experiment

Question 14

For the positive quantities h, j, and k, 15% of h is equivalent to 76% of j, and j is equivalent to 90% of k. What percentage of k is h? (Disregard the $\%$ sign when entering your answer. For example, if your answer is 39%, enter 39)

Answer:

456

Question 15

The function f is defined by $f(x) = 15x^5$. The graph of $y = f(-x) + c$ in the *xy*-plane, where c is a positive integer constant, has an *x*-intercept at $(r, 0)$ and a *y*-intercept at $(0, t)$, where r and t are constants. Which of the following must be true about r and t?

A) $r < 0$ and $t > 0$

B) $r < 0$ and $t < 0$

C) $r > 0$ and $t < 0$

D) $r > 0$ **and** $t > 0$

Question 16

In the *xy*-plane, the graph of the equation $y = -x^2 + 7x - 80$ intersects the line $y = c$ at exactly one point. What is the value of c?

A) $-\frac{271}{4}$

B) $-\frac{369}{4}$

C) $-\frac{7}{2}$

D) -80

Question 17

$$\tfrac{1}{46}x^2 + \left(s - \tfrac{1}{46}t\right)x - st = 0$$

In the given equation, s and t are positive constants. The product of the solutions to the given equation is $-2kst$, where k is a constant. What is the value of k?

Answer:

23

Question 18

A certain investment account offers a special interest rate for the first 4 months the account is open followed by a lower interest rate for the remainder of the time the account is open. Bennett opened one of these accounts with an original account balance of $\$900$ and did not make any other deposits or withdrawals. 4 months after Bennett opened the account, the balance had increased by 0.6% of the original balance. 6 months after Bennett opened the account, the balance had increased by an additional 0.3% of the balance at the end of the first 4 months. Every 2 months after the first 6 months, the balance had increased by an additional 0.3% of the balance 2 months before. Which of the following equations could represent the account balance $B(x)$, in dollars, x months after the account was opened, where $x \geq 4$?

A) $B(x) = 905.40(1.003)^{\frac{x}{2} - \frac{4}{2}}$

B) $B(x) = 905.40(1.003)^{2x - 8}$

C) $B(x) = 905.40(1.003)^{2x - 4}$

D) $B(x) = 905.40(1.003)^{\frac{x}{2} - 4}$

$$\sqrt{x^2 - 15x + 175} = x\sqrt{11}$$

What are all possible solutions to the given equation?

A) $\frac{7}{2}$ and -5

B) $\frac{7}{2}$

C) $-\frac{7}{2}$ and 5

D) 5

In triangle RST, angle T is a right angle, point L lies on $\overline{RS}$, point K lies on $\overline{ST}$, and $\overline{LK}$ is parallel to $\overline{RT}$. If the length of $\overline{RT}$ is 63 units, the length of $\overline{LK}$ is 21 units, and the area of triangle RST is 819 square units, what is the length of $\overline{KT}$, in units?

Answer:

52/3

Question 21

The area of a rectangular region is increasing at a rate of 110 square feet per hour. Which of the following is closest to this rate in **square meters per minute?** (Use 1 meter $= 3.28$ feet.)

A) 0.56

B) 10.22

C) 0.17

D) 6.01

Question 22

If $\frac{x+6}{5} = \frac{x+6}{11}$, the value of $x + 6$ is between which of the following pairs of values?

A) -7 and -5

B) 8 and 11

C) 4 and 7

D) -4 **and** 4