SAT SEPTEMBER BANK

Section 1, Module 1: Reading and Writing

Question 1

The minaret (or tower) is one of many features that are foundational to traditional mosque architecture and is therefore considered _____ blank aspect of mosque design. Even mosques that exhibit elements of multiple architectural styles, such as the Grand Jamia Mosque, which incorporates elements from the Islamic and Mughal styles, will also include several of these standard features.

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

A) an imposing

B) an embellished

C) an unprecedented

D) **a quintessential**

Question 2

The following text is adapted from Willa Cather's 1912 novel *Alexander's Bridge*.
For the next few days Alexander was very busy. He took a desk in the office of a [Scottish] engineering firm on Henrietta Street, and was at work almost constantly. He avoided the clubs and usually dined alone at his hotel.

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

A) **Continuously**

B) Imperceptibly

C) Nervously

D) Hastily

Question 3

Siemowit is said to have ruled what eventually became Poland in the 9th century. Unlike that of Zbigniew or other well-attested figures from early Polish history, Siemowit's existence has been the subject of debate, as our knowledge of him is _____ blank somewhat dubious oral traditions first written down hundreds of years after the events they describe.

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

A) unsupported by

B) independent of

C) **derived from**

D) reminiscent of

Question 4

Parapuzosia seppenradensis, known to have lived in what is now Texas, and *Parapuzosia leptophylla*, known to have lived in what is now Austria, were both ammonites, but *P. seppenradensis* was much larger than *P. leptophylla*. Recent research by Christina Ifrim, Wolfgang Stinnesbeck, and colleagues has suggested that this _____ blank resulted from the unique predator threat faced by each species.

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

A) enmity

B) anomaly

C) **disparity**

D) ambiguity

Question 5

In their study of fossils of the extinct arthropod *Mollisonia symmetrica*, Javier Ortega-Hernández, James Weaver, and team reported some obvious indications of *M. symmetrica*'s nervous system—for example, nerves extending into the animal's body parts. They also saw signs of what might be a synganglion, a brain-like mass of nerve tissue, in the animal's head. This evidence is exciting because it could help us better understand how *M. symmetrica* is related to other arthropods, such as lampyrid beetles and barnacles.

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

A) It states that barnacles are arthropods but lampyrid beetles are not.

B) It indicates that the team's claims about the *M. symmetrica* fossils are incorrect.

C) It gives the definition of the term "synganglion" used earlier in the text.

D) **It explains why the team's finding of a possible synganglion is exciting.**

Question 6

High-speed rail systems, in which trains can move at great speeds, are expanding in many countries because high-speed rail can reduce the number of automobiles on the road and ultimately conserve energy. In the Netherlands, for instance, 90 kilometers of high-speed rail lines are in operation as of 2023, and 167 kilometers are under construction.

Which choice best describes the overall structure of the text?

A) The text rejects a long-held belief and then proposes a different interpretation.

B) The text questions a course of action and then suggests alternatives to that action.

C) The text summarizes an argument and then offers a challenge to that argument.

D) **The text notes a general trend and then cites an example of that trend.**

Question 7

A microgenre is a specialized genre consisting of a comparatively small number of stylistically similar artists. The microgenre of electronic music known as hyperpop emerged in the 2010s, with the American duo 100 gecs as an early exponent. Their combination of dense synthesizer arrangements and metallic percussion with vocals electronically shifted in pitch above the natural range of lead vocalist Laura Les exemplifies the hyperpop sound. More recently, Japanese-British recording artist Rina Sawayama has contributed to that sound by incorporating pop melodies into it.

Which choice best describes the function of the underlined sentence?

A) It praises a particular hyperpop artist for consistently evolving through the years.

B) It criticizes a later hyperpop artist for being too similar to an earlier hyperpop artist.

C) **It identifies an artist who has contributed a new stylistic element to the hyperpop sound.**

D) It asserts that the hyperpop sound hasn't changed, even though new artists have adopted it.

Question 8

Women like Genevieve Grotjan Feinstein made important early contributions to the history of US cryptology, a field concerned with secure data communication and storage. Feinstein provided important intelligence information to US policymakers during World War II and the Cold War as a result of her decoding efforts for the Army Signal Intelligence Service. In this way, Feinstein and others like her helped make it possible for more women—such as Anna Lysyanskaya, who currently works in and teaches digital cryptography—to enter the field of cryptology.

Which choice best states the main idea of the text?

A) Genevieve Grotjan Feinstein and Anna Lysyanskaya worked together on an important project in the field of cryptology.

B) Cryptology should be taught more often in schools to encourage more women to enter the field.

C) **Women such as Genevieve Grotjan Feinstein and Anna Lysyanskaya have contributed to the field of cryptology.**

D) Cryptology is a field that focuses primarily on securely managing data.

Question 9

Tokyo has high pedestrian traffic, but other cities cannot increase their pedestrian traffic simply by replicating a single feature of Tokyo—e.g., its high population density—that is associated with walkability. As urbanist Mariela Alfonzo argues, many factors influence people's decision-making about whether to walk: some studies have shown the importance of personal preference, others have shown the importance of perceived safety, and so on, and it is clear that none of these factors in isolation fully explains pedestrian habits in a given city.

Based on the text, the author would most likely agree with which statement about Tokyo's "high population density"?

A) **It should be understood as just one of several factors that influence pedestrian activity in Tokyo.**

B) It affects walking decisions in Tokyo less than personal preference and perceived safety do.

C) It may increase walkability in Tokyo but is known to reduce walkability in other cities.

D) It is better understood as an effect of the high level of pedestrian traffic in Tokyo than as a cause of that pedestrian traffic.

Question 10

New York–based artist Uman is no stranger to crossing borders: born in Somalia, she lived in Kenya and Denmark before moving to the United States. Her art, too, straddles multiple boundaries. Drawing on knowledge of everything from East African fabrics to Arabic calligraphy, Uman's kaleidoscopic paintings often combine abstract shapes with anthropomorphic elements, like eyes, mouths, and gestures. Moreover, she seeks to cultivate a practice of "constant evolution" untethered from any prescriptive agenda, so that her art navigates a liminal space between tradition and autobiography, community and itinerancy, and activism and contemplation.

Which statement about Uman's art is most strongly supported by the text?

A) Its rejection of established aesthetic criteria can be traced to Uman's ambivalence toward cultural traditions.

B) Its adherence to certain dichotomies sets it apart from the work of most abstract artists based in the United States.

C) **Its openness to experimentation is evident in its diverse influences and refusal to adhere to a single conceptual frame.**

D) Its spontaneity makes it challenging for critics to recognize the conventions of genre that Uman chooses to observe.

Question 11

Benjamin Prud'homme and colleagues have explored how convergent evolution—a phenomenon that occurs when the same trait evolves independently in two reproductively separate lineages—can result from a genetic mechanism shared by both lineages. Meanwhile, Armin P. Moczek and colleagues have investigated how convergence occurs through different genetic mechanisms, but the relative prevalence of convergence through shared and different genetic processes is still poorly understood. This motivated biologists Delbert A. Green II and Cassandra G. Extavour to evaluate both types of convergence in a single study for their 2012 paper.

According to the text, what did Prud'homme and colleagues focus on in their study?

A) The convergence of traits in lineages that are not reproductively separate

B) The relative prevalence of convergent traits emerging through shared and different genetic mechanisms

C) **Convergent traits arising from a shared genetic mechanism**

D) Convergent traits arising from different genetic mechanisms

Question 12

Examples of Hoards found in Ireland and Northern Ireland

Hoard name	Date of contents	Year of discovery	Description
Broighter Hoard	1st century BCE	1896	gold pieces
Balline Hoard	4th century CE	1940	silver pieces
Dooyork Hoard	3rd century BCE–2nd century CE	2001	gold, bronze, and beads

Deposits of valuable objects, or hoards, have been unearthed in many different parts of Ireland and Northern Ireland. Some of these hoards were discovered before 2000; for example, _____ blank

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

A) the Broighter Hoard was one of several hoards discovered in the 1800s.

B) the Dooyork Hoard was discovered in 1940, and the Balline Hoard was discovered in 2001.

C) **the Broighter Hoard was discovered in 1896, and the Balline Hoard was discovered in 1940.**

D) the Balline Hoard and the Dooyork Hoard were both discovered in the 2000s.

Question 13

The Wonderful Wizard of Oz is a 1900 novel by L. Frank Baum. In the novel, Dorothy lives in Kansas with her aunt and uncle, but she later finds herself in a land called Oz. The narrator indicates that her aunt and uncle's house in Kansas is remote and solitary, writing that _____ blank

Which quotation from *The Wonderful Wizard of Oz* most effectively illustrates the claim?

A) in Kansas, "Once the house had been painted, but the sun blistered the paint and the rains washed it away, and now the house was as dull and gray as everything else."

B) in Oz, "Once more [Dorothy and her companions] could see fences built beside the road; but these were painted green, and when they came to a small house, in which a farmer evidently lived, that also was painted green."

C) **in Kansas, "When Dorothy stood in the doorway and looked around, she could see nothing but the great gray prairie on every side. Not a tree nor a house broke the broad sweep of flat country."**

D) in Oz, "Dorothy fell asleep only once, and then she dreamed she was in Kansas, where Aunt Em was telling her how glad she was to have her little girl at home again."

Question 14

Nautilids are marine mollusks that begin growing their shells before emerging from their eggs and continue to add shell segments throughout their lifetimes. The walls between their shells' chambers are called septa, and the concentration of the isotope oxygen-18 they contain exactly reflects the isotope's concentration in the water at the depth at which the septa formed. Paleontologist Amane Tajika and colleagues examined each of the septa in two nautilid shells; finding that sample M20 had a higher concentration of the isotope than sample F07 did, the researchers concluded that M20 must have formed at a significantly lower temperature than F07 did.

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

A) As water temperature increases, nautilids are able to concentrate more oxygen-18 into their shells.

B) As the concentration of oxygen-18 in water decreases, water temperature decreases and nautilid shell growth slows.

C) As water depth increases, both the concentration of oxygen-18 and the water temperature decrease.

D) **As water depth increases, the concentration of oxygen-18 increases and water temperature decreases.**

Question 15

Blue holes—large marine sinkholes, like the Dahab Blue Hole in Egypt—can be hundreds of meters deep and are sometimes part of widespread subterranean networks of passageways. In 2021, researchers conducted the first formal study of the Taam Ja' Blue Hole (TJBH), located in a bay of fresh water and salt water on Mexico's coast, and reported a maximum depth of 274 meters. Juan Carlos Alcérreca-Huerta and colleagues later reinvestigated the depth of the TJBH, determining that it exceeded 400 meters; additionally, they detected variations in characteristics across water layers. Layers more than 400 meters deep began to show density and salinity conditions akin to those of the nearby Caribbean Sea. Alcérreca-Huerta and colleagues therefore suggest that _____ blank

Which choice most logically completes the text?

A) researchers should reevaluate existing measurements of the depths of the Dahab Blue Hole and other blue holes where the conditions in very deep waters are similar to those of waters in open seas.

B) **there may be tunnels and caves that connect the TJBH and the waters of the Caribbean deep underground.**

C) the apparent relationship between depth and salinity level in the TJBH is the inverse of that found in the Caribbean Sea.

D) in the TJBH, there are greater differences between water layers less than 275 meters deep than there are between water layers greater than 400 meters deep.

Question 16

When attempting to determine a fault's seismic history, geophysicists like Dr. Estella Atekwana at the University of Delaware rely in part on data about the fault's physical dimensions and geological features. For example, data from the US Geological Survey show the _____ blank and most recent deformation (less than 15 thousand years ago) of the Belted Range fault in Nye County, Nevada.

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

A) length, (25 km); slip rate, (less than 0.2 mm/yr);

B) length, (25 km), slip rate, (less than 0.2 mm/yr),

C) length (25 km) slip rate (less than 0.2 mm/yr)

D) **length (25 km), slip rate (less than 0.2 mm/yr),**

Question 17

When the electrons of a chemical element change energy states, they release certain wavelengths of light that are unique to that element. This means that the emission of light with a wavelength of 481 nanometers (nm), which falls in the 450–500 nm range defining the blue portion of the visible spectrum, _____ blank the element zinc as the source of the light.

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

A) **identifies**

B) to identify

C) identifying

D) having identified

Question 18

The quaking aspen (*Populus tremuloides*) known as Pando, located in the United States, is one of the oldest known trees in the world, at 14,000 to 80,000 years old. With up to eighty millennia of climate data in its tree _____ blank single tree like this, claims dendrochronologist Valerie Trouet, can tell the history of the world.

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

A) rings. A

B) rings; a

C) rings and a

D) **rings, a**

Question 19

As the exoplanet 51 Pegasi b orbits a star 50 light-years from Earth, the gas giant's gravity causes the star to wobble. In 1995, astronomers observing the wobble—indicated by redshifts and blueshifts in the star's spectral wavelengths—eventually attributed _____ blank to the gravitational influence of the previously undetected exoplanet.

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

A) these

B) each

C) **it**

D) them

Question 20

Wakening was first released in 2013. This short _____ blank is about a woman attempting to solicit help from an ancient creature, was directed by Cree-Métis filmmaker Danis Goulet.

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

A) fantasy,

B) fantasy

C) fantasy which

D) **fantasy, which**

Question 21

In July 1862, Joseph Pierce joined the US Army. He went on to serve in the 14th Connecticut Volunteers during the US Civil War and, _____ blank earned a place in US history as one of the war's few Chinese-born American soldiers.

Which choice completes the text with the most logical transition?

A) in any case,

B) for instance,

C) usually,

D) **in doing so,**

Question 22

The World Cup of men's soccer, one of the biggest sporting events on the planet, brought 32 national teams from six continents to the host country, Russia, in 2018. The event, which is held every four years, used to be much smaller and more limited geographically. _____ blank the 1962 World Cup in Chile included only 16 teams, all from Europe and the Americas.

Which choice completes the text with the most logical transition?

A) However,

B) At last,

C) **For example,**

D) In addition,

Question 23

Karel Čapek's 1920 play *R.U.R. (Rossum's Universal Robots)*, in which artificial workers overthrow their masters, left an indelible mark on the science fiction genre, and the English language, by introducing the term "robot" (derived from the Czech word *robota*, meaning "indentured labor" or "drudgery"). _____ blank Čapek's play also contributed to a venerable literary and mythological tradition: using artificial beings as mirrors and foils for humanity.

Which choice completes the text with the most logical transition?

A) Ultimately limited in its lasting influence,

B) By achieving such a lofty goal,

C) **Beyond the simple coining of a term,**

D) Despite its creation of such an iconic trope,

Question 24

In a given rock formation, Albian rock from 113 million years ago might directly abut Viséan rock from 346.7 million years ago, with millions of years of material missing in between. _____ blank time did not stand still during these intervening years; the unaccounted-for sedimentary material was likely removed from the stratigraphic record via erosion and weathering.

Which choice completes the text with the most logical transition?

A) On the contrary,

B) In particular,

C) **Of course,**

D) As a result,

Question 25

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

- The Rhine River is in Europe.
- It ranks No. 129 among the longest rivers in the world.
- It is 1,233 kilometers long.
- The Niger River is in Africa.
- It ranks No. 14 among the longest rivers in the world.
- It is 4,200 kilometers long.

The student wants to compare the lengths of the two rivers. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) Among the longest rivers in the world, the Niger River is ranked No. 14.

B) **The Rhine River is shorter than the Niger River.**

C) The Niger River is in Africa, whereas the Rhine River is located in Europe.

D) The Rhine River in Europe is 1,233 kilometers long.

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.
- Douglas Engelbart won the award in 1997.

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

A) **The A.M. Turing Award, which is named for British mathematician Alan Turing, was given to Douglas Engelbart in 1997.**

B) It was in 1997 that Douglas Engelbart won the A.M. Turing Award.

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

D) In 1997, Douglas Engelbart won the A.M. Turing Award, which is given for "major contributions of lasting importance to computing."

Question 27

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

- In music theory, the term "key" refers to the set of musical notes that forms the foundation of a piece of music.
- In *Ideas Toward an Aesthetic of Music* (1806), German poet and composer Christian Schubart describes the mood of various musical keys.
- He describes the key of C minor as expressing "longing."
- "Don't Speak" (1996) by No Doubt is a song written in C minor.

The student wants to explain how Schubart describes C minor. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) The song "Don't Speak" could be described as expressing "longing."

B) **In *Ideas Toward an Aesthetic of Music*, Schubart describes the mood of C minor as expressing "longing."**

C) The key of C minor is one of various keys, which are sets of musical notes that form the foundations of pieces of music.

D) In *Ideas Toward an Aesthetic of Music*, Schubart describes the mood of C minor.

Section 1, Module 2 Reading and Writing

Question 1

Lady Grant and colleagues _____ blank pots of sterilized soil with slurries of live microbes collected from soil in five sites across Colorado, including areas of sagebrush and ponderosa pine forest. Grant and team then grew mustard plants in the pots to see if the different microbial slurries affected levels of spicy glucosinolates like indole in the plants' seeds.

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

A) sanitized

B) **populated**

C) precluded

D) estimated

Question 2

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 display of nature.

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

A) **Spectacle**

B) Pretentiousness

C) Resemblance

D) Deception

Question 3

As a work of scholarship, *Advancing U.S. Latino Entrepreneurship* (2020) is notable for its _____ blank. Featuring contributions from Zulema Valdez, Bea Stotzer, 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) **scope**

B) impartiality

C) terseness

D) reputation

Question 4

The _____ blank of leaf-vein architectures—the branching venation of *Ginkgo biloba*, the hierarchical netlike venation of *Clematis reticulata*, 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) **multifariousness**

B) obstinacy

C) entanglement

D) culpability

Question 5

The metal featured in both the structure of the ARK by APOLLO Architects Associates and the hardware in the House in Goido by FujiwaraMuro Architects is representative of a trend in contemporary Japanese interior design to juxtapose sleek, modern accents with traditional organic materials such as cypress. 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 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.

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

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

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

Question 6

Text 1
In separate studies, Guihua Wang 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. Wang 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 He and colleagues' study did not take.

Text 2
Wang 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) He and colleagues' study did not find convincing evidence of nutrient transfer between individual plants.

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

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

Question 7

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?

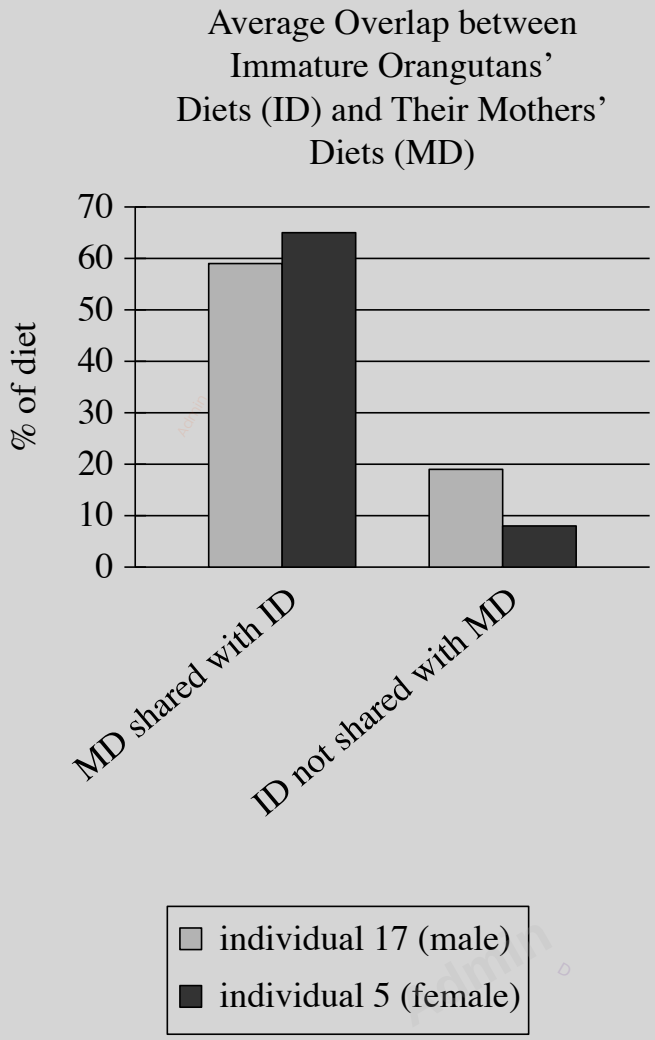
A) Analysis of the earliest available records of a sovereign state's finances can be found not in the work of Brewer but in that of Drelichman and Voth.

B) 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.

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) 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.

Question 8



- For each data category, the following bars are shown:
  - individual 17 (male)
  - individual 5 (female)
- The % of diet data for the 2 categories are as follows:
  - MD shared with ID:
    - individual 17 (male): 59%
    - individual 5 (female): 65%
  - ID not shared with MD:
    - individual 17 (male): 19%
    - individual 5 (female): 8%

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 majority of the diet of the mother of individual 5 was shared with the diet of individual 5, whereas significantly less than half the diet of the mother of individual 17 was shared with the diet of individual 17.

B) **The percent of the mother's diet shared with its offspring's diet was smaller for individual 17 than for individual 5, and the percent of the individual's diet not shared with its mother's diet was greater for individual 17 than for individual 5.**

C) Neither individual 17 nor individual 5 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.

D) The percent of individual 5's mother's diet that was shared with individual 5's diet ranged from approximately 59% to approximately 65%, whereas the percent of individual 17's mother's diet that was shared with individual 17's diet ranged from approximately 8% to approximately 19%.

Question 9

Broken-Wing Display in Various Bird Species

Species name	Common name	Order	Performs broken-wing display?
Zenaida meloda	West Peruvian dove	Columbiformes	No
Calidris maritima	purple sandpiper	Charadriiformes	No
Dendroica pinus	pine warbler	Passeriformes	Yes
Dendragapus fuliginosus	sooty grouse	Galliformes	Yes
Actitis hypoleucos	common sandpiper	Charadriiformes	Yes

While observing birds for a biology class, a group of students noticed a lesser sand plover (*Charadrius mongolus*), 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) 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.

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

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

D) **Both the sooty grouse and the pine warbler are known to perform broken-wing display.**

Question 10

The bird species *Tachyphonus surinamus* (the fulvous-crested tanager) 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, *Percnostola rufifrons* (the black-headed antbird), with which *T. surinamus* 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 *T. surinamus* alarm calls, only *T. surinamus* displayed predator-avoidance behavior, whereas both *T. surinamus* and *P. rufifrons* displayed such behavior when *P. rufifrons* alarm calls were played.

B) When Martínez and colleagues played control sounds of random noise, only *P. rufifrons* displayed predator-avoidance behavior, whereas both *P. rufifrons* and *T. surinamus* displayed such behavior when alarm calls from another local bird species were played.

C) When Martínez and colleagues played alarm calls from a species that does not share territory with *T. surinamus* and *P. rufifrons*, *T. surinamus* displayed predator-avoidance behavior, whereas *P. rufifrons* did not display any behavioral change.

D) **When Martínez and colleagues played alarm calls from another local bird species, *P. rufifrons* displayed predator-avoidance behavior, whereas *T. surinamus* did not display any behavioral change.**

Question 11

Canada, which, according to international indices, has relatively strong democratic institutions and low intranational income inequality, experienced an inflation rate of 2.26% in 2018, whereas Oman, which shows the opposite pattern on such indices, had an inflation rate of only 0.88% 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) international indices may have underestimated the strength of Canada's democratic institutions relative to Oman's.

B) inflation in Canada in 2018 would have been higher if Canada's government had less control over the economy.

C) **factors other than Canada's political structure contributed to the country's inflation rate exceeding that of Oman in 2018.**

D) the 2018 difference between Canada's inflation rate and Oman's inflation rate is primarily but not exclusively attributable to the different levels of intranational income inequality in the two countries.

Question 12

Nature reserves 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 Hasita Bhammar 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) 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.

C) **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.**

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.

Question 13

The subscription economy has rapidly expanded to include a wide range of products—from books to cloud storage—in part because consumers appreciate the convenience of automatic payments. But as a study by Ben Klopack 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) **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.**

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

Question 14

Should South Korea cut taxes? As of 2017, South Korea's top tax rate (49%) 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 South Korea 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, the

B) economists the

C) economists; as the

D) **economists. The**

Question 15

Some places that were once part of the Spanish Empire, such as Sardinia, reveal few traces of a past connection to Spain, linguistic or otherwise. In contrast, Argentina 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 Argentina.

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

A) **being**

B) is

C) is being

D) will be

Question 16

On June 30, 1908, a 160-foot-wide space rock hurtling toward Earth exploded in a remote forested area of Siberia. Known as the Tunguska event, after a river that ran through the region, _____ blank June 30 has been officially denoted International Asteroid Day.

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

A) the forest that inspired an annual day of asteroid awareness had approximately 800 square miles obliterated by the explosion:

B) an annual day of asteroid awareness was inspired by the explosion, which obliterated approximately 800 square miles of forest:

C) **the explosion obliterated approximately 800 square miles of forest and inspired an annual day of asteroid awareness:**

D) approximately 800 square miles of forest were obliterated by the explosion, which inspired an annual day of asteroid awareness:

Question 17

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; the

D) species, and the

Question 18

Breaking ties with the Soviet Union in 1991 catalyzed a host of infrastructural changes for the newly independent Latvia, 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) had enabled

B) would enable

C) enabled

D) **enabling**

Question 19

Researchers recently theorized that Copper Age (3500 BCE to 2750 BCE) owl-shaped carvings collected from Iberian archaeological sites were likely toys created by children. This hypothesis, based on comparative analyses of owl drawings made by modern children, is supported by the objects predominantly being crafted from slate—a material that, because of its _____ blank be easily carved by small hands using rudimentary tools.

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

A) malleability—could

B) **malleability, could**

C) malleability could

D) malleability could—

Question 20

Located on the Emscher River in Germany, the city of Dortmund 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

Paul Austerlitz of Gettysburg College, along with researchers Maureen Mahon of New York University and Michael Veal of Yale 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) are serving

B) have served

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, Wisconsin's Antigo soil was formally designated in 1983, and Vermont's Tunbridge soil in 1985. _____ 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) **In many cases,**

B) Therefore,

C) Indeed,

D) Similarly,

Question 23

Although the Eskimo-Aleut language of Inuktun has only about 1,200 living speakers, most in Greenland, the New York City–based Endangered Language Alliance has identified a group of Inuktun speakers in the city's borough of Manhattan. _____ blank in the borough's Upper West Side neighborhood, these speakers are both helping to ensure Inuktun's survival and contributing to the city's unmatched linguistic diversity.

Which choice completes the text with the most logical transition?

A) Likewise,

B) There,

C) Consequently,

D) For example,

Question 24

William Duer employed the pseudonym "Philo-Publius"—a reference to an ancient Roman statesman—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 Duer aligned his 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) Conversely,

B) Indeed,

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 Huallaga River in Peru 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) Over time, many meanders have formed in the Huallaga River, a river in Peru with high sinuosity.

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

C) A high-sinuosity river, the Huallaga 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.
- Domenico Pizigano was a fifteenth-century Venetian cartographer of portolan charts.
- Portolan charts were early nautical charts that mapped the waterways of the Mediterranean and Black Seas.
- Portolan charts in the Venetian tradition tended to be sparse in illustrations.
- Those in the Majorcan tradition tended to be richly illustrated.
- In Majorcan charts, the Atlas Mountains are depicted as a palm tree, 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) Unlike Venetian portolan charts, which could include illustrations of palm trees and shepherds' crooks, Majorcan charts were sparse in illustration.

B) Being in the Majorcan tradition, the portolan charts of Gabriel de Vallseca differed from those of the Venetian cartographer Domenico Pizigano.

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

D) **Majorcan portolan charts, unlike their sparser Venetian 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 Zenos Frudakis's twenty-foot-long bronze sculpture *Freedom Sculpture* is on display along a public sidewalk in Philadelphia, Pennsylvania.
- This work of public art depicts a group of people emerging from the side of a building.
- Artist David McCracken's thirty-one-foot-long aluminum sculpture *Diminish and Ascend* is on display in a public botanical garden in Christchurch, New Zealand.
- This work of public art depicts a staircase that appears to ascend into the clouds.

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

A) In contrast to Frudakis's *Freedom Sculpture*, McCracken's *Diminish and Ascend* is displayed in a public place.

B) **Frudakis's *Freedom Sculpture*, unlike McCracken's *Diminish and Ascend*, depicts human subjects.**

C) *Freedom Sculpture* by Frudakis and *Diminish and Ascend* by McCracken are two examples of public art.

D) McCracken's sculpture *Diminish and Ascend*, which depicts a staircase that appears to ascend into the clouds, is on display in Christchurch, New Zealand.

Section 2, Module 1 Math

Question 1

Which expression is equivalent to $v^4 - 460v^3$?

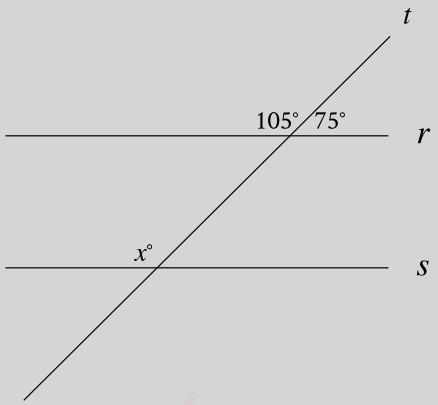
A) $(v^2 + 46)(v^2 - 10)$

B) $(v^2 - 46)(v^2 - 10)$

C) $v^3(v - 460)$

D) $v^3(v + 460)$

Question 2



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) 15

B) 180

C) 90

D) 105

Question 3

The width of a rectangle is 9 centimeters. The length of the rectangle is 50 centimeters longer than the width. What is the area, in square centimeters, of this rectangle?

A) 18

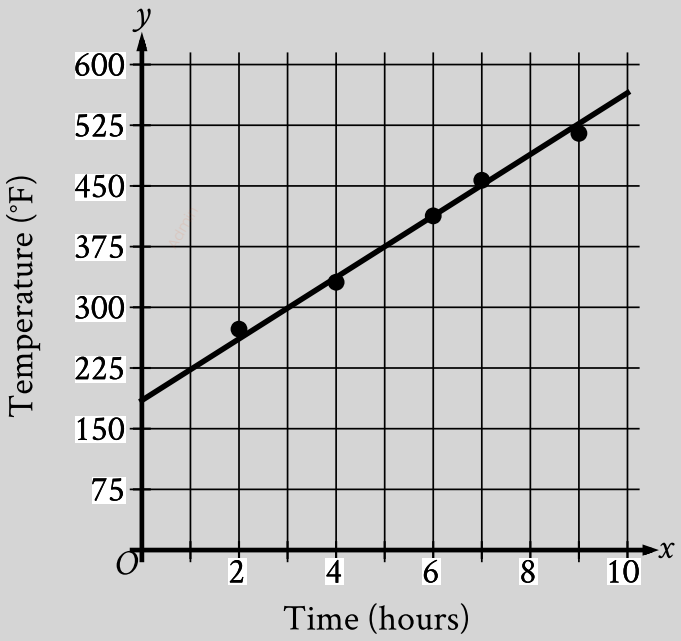
B) 531

C) 68

D) 9

Question 4

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?

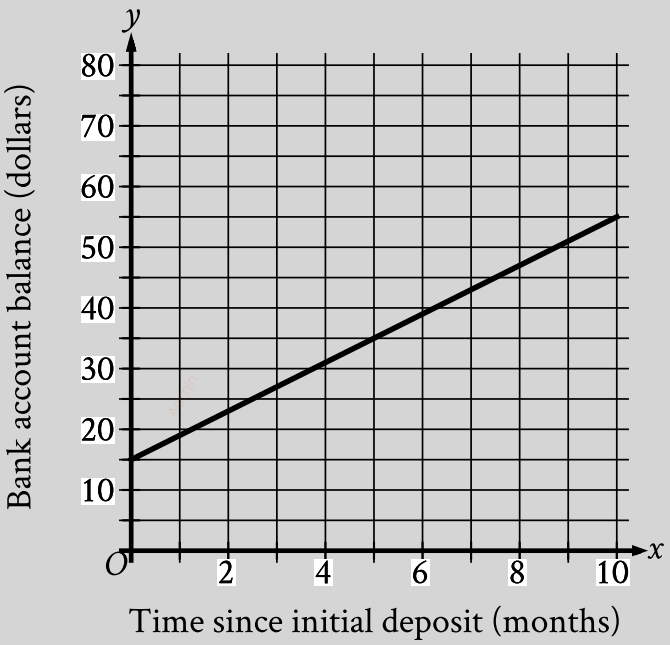
A) The predicted temperature decreases at a constant rate of approximately 40°F per hour over the 10-hour period.

B) **The predicted temperature increases at a constant rate of approximately 40°F per hour over the 10-hour period.**

C) The predicted temperature increases at a constant rate of approximately 185°F per hour over the 10-hour period.

D) The predicted temperature decreases at a constant rate of approximately 185°F per hour over the 10-hour period.

Question 5



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

Question 6

$$y = -15x + 21$$

$$y = -21x + 27$$

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

A) $(21, 27)$

B) $(27, 21)$

C) $(1, 6)$

D) $(6, 1)$

Question 7

$$f(x) = -16x^2 + 76$$

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:

76

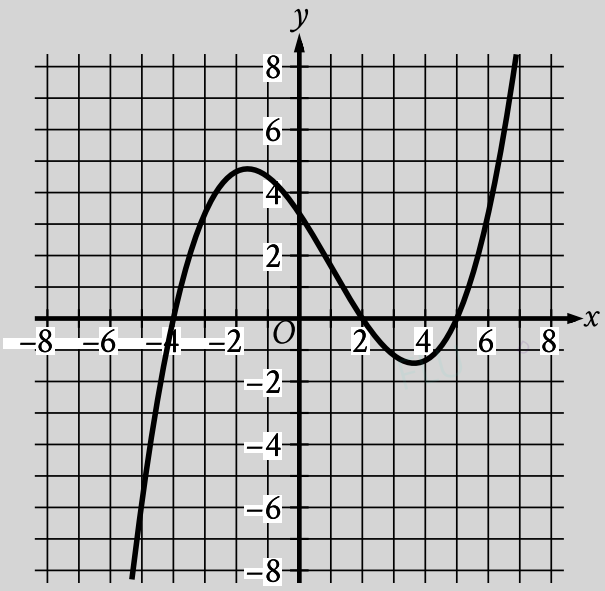
Question 8

During hibernation, American black bears do not eat or replenish calories. A certain black bear weighed 338 pounds when entering hibernation and lost weight at a rate of 0.7 pound per day. At this rate, how many days after entering hibernation did the black bear weigh 310 pounds?

Answer:

40

Question 9



The graph of the polynomial function f is shown, where $y = f(x)$. What is the value of $f(2)$?

A) 2

B) 5

C) -4

D) 0

Question 10

A dog's mass is 37 kilograms. What is the dog's mass, in grams? $(1 \text{ kilogram} = 1{,}000 \text{ grams})$

Answer:

37000

Question 11

A freight elevator can hold a maximum weight of $4{,}840$ pounds during one trip. A 170-pound person needs to deliver several boxes using the freight elevator. Some of these boxes weigh 21 pounds each and the others weigh 62 pounds each. Which inequality represents the possible combinations of the number of 21-pound boxes, x, and the number of 62-pound boxes, y, the person can deliver during one trip if only the person and the boxes are on the freight elevator?

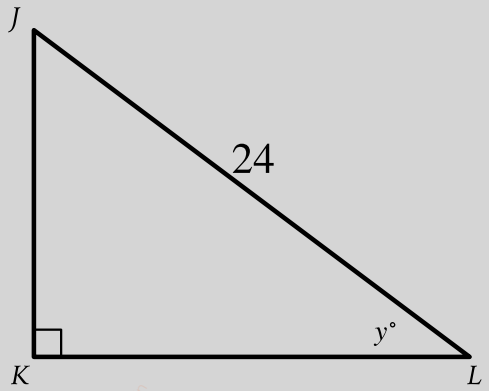
A) $21x + 62y \geq 4{,}670$

B) $21x + 62y \leq 4{,}670$

C) $62x + 21y \geq 4{,}840$

D) $62x + 21y \leq 4{,}840$

Question 12



Note: Figure not drawn to scale.

In triangle JKL, $\cos y^\circ = \frac{23}{24}$. What is the length of $\overline{KL}$?

Answer:

23

Question 13

$$b - 20 = \frac{x}{y}$$

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

A) $x = \frac{b-20}{y}$

B) $x = by - 20y$

C) $x = \frac{by-20}{y}$

D) $x = by - 20$

Question 14

In the *xy*-plane, the graph of the linear function h contains the points $(0, 0)$ and $(1, 40)$. Which equation defines h, where $y = h(x)$?

A) $h(x) = \frac{1}{40}x + 40$

B) $h(x) = x + 40$

C) $h(x) = 40x + 40$

D) $h(x) = 40x$

Question 15

$$3x + y = 13$$

$$4x - y = 15$$

How many solutions does the given system of equations have?

A) **Exactly one**

B) Zero

C) Exactly two

D) Infinitely many

Question 16

$$\frac{(x-6)(x-8)}{x-5} = 0$$

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

A) 14

B) 19

C) 5

D) 8

Question 17

The measure of angle K is $\frac{\pi}{2(16)}$ radians. The measure of angle L is 16 times the measure of angle K. What is the measure, in degrees, of angle L?

A) 16

B) 90

C) 74

D) 106

Question 18

All the sidewalk paving stones in a neighborhood are rectangular. The length of each of these paving stones is 41 centimeters greater than the width. Which equation gives the area A, in square centimeters, of a sidewalk paving stone in terms of the width w, in centimeters, of that paving stone?

A) $A = (w)\left(\frac{w}{41}\right)$

B) $A = (w)(41w)$

C) $A = (w)(w + 41)$

D) $A = w^2$

Question 19

What is the *y*-intercept of the graph of $y = 10^x + 22$ in the *xy*-plane?

A) $(0, 32)$

B) $(0, 22)$

C) $(0, 23)$

D) $(0, 10)$

Question 20

$$-3x + 18px = 90$$

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

A) 5

B) 0

C) $\frac{5}{3}$

D) $\frac{1}{6}$

Question 21

The density of a certain type of marble stone is 2.3000 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:

43278

Question 22

The function w is defined by $w(r) = \frac{1}{r-5} - \frac{r-4}{-r+4.25}$. What is the greatest possible value of r such that $w(r) = 0$?

Answer:

4.5

Section 2, Module 2: Math

Question 1

Which expression is equivalent to $(3x^3 - 4x + 9) - (6x^6 + 8x - 4)$?

A) $-3x^9 - 12x - 13$

B) $-6x^6 + 3x^3 - 12x + 13$

C) $-6x^6 + 3x^3 + 4x + 5$

D) $-3x^9 - 4x + 5$

Question 2

What is the slope of the graph of $y = \frac{9}{17}x$ in the *xy*-plane?

A) 0

B) $\frac{17}{9}$

C) $\frac{9}{17}$

D) $-\frac{9}{17}$

Question 3

$$32x + 81y = 290$$

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 290 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:

4

Question 4

$$x^2 + 13x = -9$$

What are all possible solutions to the given equation?

A) $\frac{-13 \pm \sqrt{133}}{2}$

B) $\frac{-13 \pm \sqrt{133}}{26}$

C) 0

D) $\frac{-13 \pm \sqrt{133}}{18}$

Question 5

$$y < x$$

$$y > -3x - 11$$

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
4	2
5	3
6	4

B)

x	y
4	9
5	8
6	7

C)

x	y
-9	-11
-8	-10
-7	-9

D)

x	y
-9	-2
-8	-3
-7	-4

Question 6

$$f(x) = 5(g(x)) - 2$$

$$g(x) = |13x - 9|$$

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

A) 139

B) -52

C) 685

D) 693

Question 7

The population of a certain city doubled every 75 years from 1663 to 1963. The population of this city was $240{,}000$ in 1963. What was the population of this city in 1663?

Answer:

15000

Question 8

Line k is defined by $6x + 19y - 7 = 0$. Line j is perpendicular to line k in the *xy*-plane. What is the slope of line j?

A) $\frac{19}{6}$

B) $-\frac{6}{19}$

C) $\frac{7}{19}$

D) $-\frac{19}{7}$

Question 9

In the *xy*-plane, an equation of circle A is $(x - 3)^2 + (y - 9)^2 = 25$. 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) $(x - 3)^2 + (y - 9)^2 = 625$

B) $(x - 3)^2 + (y - 9)^2 = 250$

C) $(x - 3)^2 + (y - 9)^2 = 50$

D) $(x - 3)^2 + (y - 9)^2 = 100$

Question 10

The length of the diagonal of a square is $\frac{176\sqrt{2}}{2}$ units. What is the area, in square units, of the square?

A) 88

B) 15,488

C) 7,744

D) 352

Question 11

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

A)

Value	Frequency
30	4
40	3
50	3
60	4

B)

Value	Frequency
30	3
40	3
50	3
60	3

C)

Value	Frequency
30	1
40	2
50	3
60	4

D)

Value	Frequency
30	5
40	2
50	2
60	5

Question 12

A partially filled container containing 21 milliliters of water is placed under a leaky faucet that produces one 0.06-milliliter drop of water every 6 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 6?

A) $v = 6t$

B) $v = 0.36t + 21$

C) $v = 0.01t + 21$

D) $v = 0.06t + 21$

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 80 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. 32 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 80 students who participated in the experiment

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

D) The 32 students who were able to correctly identify the pureed food sample while wearing nose plugs

Question 14

For the positive quantities h, j, and k, 42% of h is equivalent to 84% of j, and j is equivalent to 64% 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:

128

Question 15

At the beginning of an experiment, the temperature of a liquid is 23 degrees Celsius $(^\circ\mathrm{C})$. During the first 4.0 minutes of the experiment, the temperature of the liquid increases at an average rate of $6.5\,^\circ\mathrm{C}$ per minute. Then, the temperature of the liquid increases at a constant rate of $2.4\,^\circ\mathrm{C}$ per minute. If the temperature of the liquid reaches $63\,^\circ\mathrm{C}$ x minutes after the beginning of the experiment, where $x > 4.0$, which equation represents this situation?

A) $63 = 2.4(x - 4.0) + 26$

B) $63 = 2.4x + 23$

C) $63 = 2.4(x - 4.0) + 49$

D) $63 = 2.4x + 49$

Question 16

The function f is defined by $f(x) = 24x^3$. 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 17

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 0.1% 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 0.1% 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) $B(x) = 905.40(1.001)^{2x-8}$

B) $B(x) = 905.40(1.001)^{2x-4}$

C) $B(x) = 905.40(1.001)^{\frac{x}{2}-\frac{4}{2}}$

D) $B(x) = 905.40(1.001)^{\frac{x}{2}-4}$

Question 18

In the *xy*-plane, the graph of the equation $y = -x^2 + 7x - 76$ intersects the line $y = c$ at exactly one point. What is the value of c?

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

B) $-\frac{353}{4}$

C) -76

D) $-\frac{255}{4}$

Question 19

$$\frac{1}{58}x^2 + \left(s - \frac{1}{58}t\right)x - st = 0$$

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:

29

Question 20

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 72 units, the length of $\overline{LK}$ is 24 units, and the area of triangle RST is 468 square units, what is the length of $\overline{KT}$, in units?

Answer:

26/3

Question 21

The area of a rectangular region is increasing at a rate of 310 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) 28.81

B) 1.58

C) 16.95

D) 0.48

Question 22

If $\frac{x+5}{3} = \frac{x+5}{12}$, the value of $x + 5$ is between which of the following pairs of values?

A) 2 and 6

B) -2 **and** 2

E-A

C) -6 and -3

D) 7 and 12