Section 1, Module 1: Reading and Writing

Question 1

Amaranth grain was domesticated in Mexico. Its physical structure is no longer identical to the structure of the wild plant it is descended from. Summer squash also _____blank its wild ancestor. That ancestor plant had a hard rind and bitter flesh. Indigenous people in eastern North America carefully bred the crop until it had a soft rind and mild-tasting flesh.

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

A) reacts to

B) **varies from**

C) helps with

D) argues with

Question 2

The adult io moth appears black, orange, and yellow with large eyespots as a result of pigmented scales that cover its wings and body. Although scales are widely known as the source of a moth's color and pattern, the _____blank of these scales goes beyond visual display: they also detach when moths are caught in a spiderweb.

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

A) attractiveness

B) **utility**

C) tendency

D) frailty

Question 3

Despite a growing view among young people and others in South Africa that celebrated anti-apartheid leader Nelson Mandela should have taken greater strides as president to effect more substantive structural changes in the country's stratified society, years after his death in 2013 Mandela continues to be _____blank by many worldwide.

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

A) **lauded**

B) reinterpreted

C) evaluated

D) criticized

Question 4

The dinosaur displays at museums such as the Naturmuseum Senckenberg in Frankfurt (which has a life-sized *Diplodocus longus* statue among its holdings) are notable for the _____blank of the research behind them—the museum staff consulted numerous sources to ensure the accuracy of the displays.

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

A) novelty

B) shallowness

C) **rigor**

D) obscurity

Question 5

The following text is adapted from Eugene O'Neill's 1920 play *Beyond the Horizon*. Andrew and Robert Mayo are brothers who grew up on their family's farm.
ANDREW: Farming ain't your nature. There's all the difference shown in just the way us two feel about the farm. You—well, you like the home part of it, I expect; but as a place to work and grow things, you hate it. Ain't that right?
ROBERT: Yes, I suppose it is. For you it's different. You're a Mayo through and through. You're wedded to the soil. You're as much a product of it as an ear of corn is, or a tree. Father is the same. This farm is his life-work.

Which choice best states the main purpose of the text?

A) It describes a place two characters visited on vacation.

B) It illustrates that two characters share a goal.

C) **It emphasizes a difference between two characters.**

D) It shows how two characters solved a mystery.

Question 6

In the past, historians who wanted to examine Frederick Douglass's diary and other personal papers had to visit the Library of Congress in Washington, DC, to view them on microfilm (film containing scaled-down reproductions of documents). But traveling to the library often added time and costs to research projects. Now, by going to the library's website, researchers can access digitized versions of Douglass's papers without physically going anywhere.

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

A) It summarizes an unexpected finding.

B) It describes a debate among historians.

C) It gives information about a famous person.

D) **It explains the meaning of a word.**

Question 7

Built in the 1970s, Raccoon Mountain is a pumped-storage hydropower facility (a "water-battery") located in the United States along the Tennessee River. When energy demand is low, excess power from the regional electric utility's nuclear plants is used to pump water (from a lower reservoir filled from the Tennessee River) up a shaft to the summit lake, where the water is stored as gravitational potential energy. When energy demand peaks, the water drains down from the summit lake, spinning turbines and generating upward of 1,700 megawatts of power—enough to power one million homes for twenty hours.

Which choice best states the main purpose of the text?

A) To discuss the benefits of a new energy technology

B) To encourage regional electric utilities to build energy storage facilities

C) To point out the differences between two methods of energy generation

D) **To explain the basics of how a specific energy technology works**

Question 8

Text 1

The Roadmender, *The Life of Martin R. Delany*, and twenty-three other works of the late 1800s and early 1900s were rereleased in 2020 as publicity for a prestigious prize for women writers of fiction. Recognizing that women long had to use male pseudonyms for their works to be granted serious consideration (by publishers and readers alike), the campaign restored the authors' given female names in place of such pseudonyms and brought visibility to identities that should not have been hidden.

Text 2

The belief that women historically were barred from publishing under names perceived as female is persistent. That it is also an overgeneralization becomes obvious when considering writers such as Elizabeth Barrett Browning, who published *Poems* and many other works under her own name in the 1800s, and Mary Mackay, who elected to use the female pseudonym Marie Corelli for her novels and stories in the late 1800s.

Based on the texts, how would the author of Text 2 most likely respond to the overall characterization in Text 1 of the publicity campaign?

A) By acknowledging that the circumstances of publication for Barrett Browning and Mackay differed from those for the authors whose works are the focus of Text 1, given that Barrett Browning and Mackay each published multiple works

B) By asserting that while it is clearly inappropriate to conclude that Barrett Browning was motivated by the same set of factors as the authors of the works discussed in Text 1 to publish under the names they did, it is appropriate to conclude that Mackay was

C) By agreeing that the authors of *The Roadmender*, *The Life of Martin R. Delany*, and the other works referred to in Text 1 were not afforded the same opportunities as Barrett Browning and Mackay to shape their own representations when publishing

D) **By suggesting that Barrett Browning and Mackay are among the historical examples that challenge the assumption about the historical use of pseudonyms by female writers that is presented in Text 1**

Question 9

When people think of dinosaurs with feathers, they typically think of winged dinosaurs, such as the four-winged *Microraptor*. However, many dinosaurs that didn't have wings also had feathers on their bodies. For instance, research indicates that the wingless, speedy *Ornithomimus* likely had feathers.

Which choice best states the main topic of the text?

A) Animals without feathers

B) Dinosaurs with feathers

C) The most valuable fossil

D) Bird species

Question 10

The following text is from María Amparo Ruiz de Burton's 1885 novel *The Squatter and the Don*.
Don Mariano Alamar was silently walking up and down the front piazza of his house at the rancho; his hands listlessly clasped behind and his head slightly bent forward in deep thought. He had pushed away to one side the many arm-chairs and wicker rockers with which the piazza was furnished. He wanted a long space to walk. That his meditations were far from agreeable, could easily be seen by the compressed lips, slight frown, and sad gaze of his mild and beautiful blue eyes.

Based on the text, why does Don Mariano push aside the furniture on the piazza?

A) He is making his home more comfortable for his family.

B) He feels that walking an uninterrupted path will help him think through a difficult issue.

C) He wishes to create the impression that he often receives important guests at his home.

D) He wants to make space so that he can engage in vigorous exercise.

Question 11

Average Hours Worked per Person per Year in 1950 and 2017

Country	1950	2017	Change in hours	Percent change in hours
United Kingdom	2,184	1,670	−514	−24%
Australia	2,178	1,731	−447	−21%
Germany	2,427	1,354	−1,074	−44%
Mexico	2,432	2,255	−177	−7%

Calculations may be inexact due to rounding.

A student in an economics course is examining the decline since 1950 in average hours worked per person per year in various nations due to both increased productivity and the adoption of policies that limit working hours. The first task in this investigation is to determine how the decline in the United Kingdom compares to that in other countries. The student finds that _____blank

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

A) though the percent decrease in hours worked in the United Kingdom was greater than that in Germany and Mexico, it was less than that in Australia.

B) while the number of hours worked rose in the United Kingdom from 1950 to 2017, it declined in Germany, Australia, and Mexico.

C) the decline in number of hours worked was greater in the United Kingdom than it was in Germany, Australia, or Mexico.

D) though the percent decrease in hours worked in the United Kingdom was less than that in Germany, it was greater than that in Australia and Mexico.

Question 12

Impact of Three Key Industries on Oklahoma Economy in 2017

Industry	Approximate total contribution by industry	Number of people employed by industry	Average contribution per employee by industry
Construction	$6,797,300,000	77,247	$87,994
Manufacturing	$16,707,500,000	128,122	$130,403
Tribal economic activity	$7,312,400,000	51,674	$141,510

The nearly forty tribes located in Oklahoma, including the Osage Nation and the Seminole Nation, operate numerous businesses, employ tens of thousands of people, and generate billions of dollars in revenue. A student in an economics class is researching the tribes' collective activity as a single industry. The student wants to compare that industry's role in Oklahoma in 2017 with the roles of other industries in the state. Looking at a table with information about three industries, the student finds that compared with the other two industries, tribal economic activity _____blank

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

A) made the lowest total contribution by industry.

B) made the highest average economic contribution per employee.

C) ranked highest in all three economic measures listed in the table.

D) employed the same number of people as construction.

A creole language is an amalgam of a lexifier, or primary contributor of grammar and vocabulary, with one or more substrates, or secondary contributors. English-lexifying creoles in North America, such as Afro-Seminole Creole, rely on West African substrates, while Hawaiian Pidgin relies on 'Ōlelo Hawai'i, the Polynesian language of the Native Hawaiian people, with further contributions from Korean and other East Asian languages, Portuguese, and Spanish. This is a heterogeneous history, even for a creole language. Moreover, numerous similarities are found among the East Asian substrates, as well as between Portuguese and Spanish. Thus, it can be challenging to credit certain words or features of grammar or pronunciation to any one substrate.

Which statement, if true, would best illustrate the challenge described in the text?

A) As is also the case with some first-language speakers of Afro-Seminole Creole, many first-language speakers of Hawaiian Pidgin align their pronunciation, word choice, and syntax more closely with English in certain conversational contexts than in others.

B) Stative structures in which verbs modify subjects and serve a descriptive function comparable to that of adjectives are hallmarks of Hawaiian Pidgin as well as of East Asian languages such as Korean, yet the syntax of Hawaiian Pidgin's stative structures confirms their origin in 'Ōlelo Hawai'i.

C) Hawaiian Pidgin's substitution of "d" for the voiced "th" consonant (as used in "that") and of "t" for the unvoiced "th" consonant (as used in "thick") can be credited to the absence of "th" consonants in 'Ōlelo Hawai'i, though most other Polynesian languages lack "th" consonants too.

D) **The usage of the Hawaiian Pidgin verb "ste" to convey a temporary state, as in the statement "da watah ste cold" (the water is cold), most nearly resembles that of the 'Ōlelo Hawai'i verb *noho*, though the Portuguese verb *ficar* and the Spanish verb *estar* have similar usages and may also exert an influence on "ste."**

The great egret and the wood stork are long-legged birds that live in wetlands, like the Everglades in Florida. Laura D'Acunto and colleagues wanted to know how these birds choose an area in which to live. They looked at features of the birds' habitats, such as the extent of tree-canopy coverage in the area and how deep the water is during the birds' breeding season. They found that great egrets prefer areas with deep water during breeding season, but that was not true for wood storks. The researchers concluded that water management strategies that increase the depth of water in potential wetland bird habitats during breeding season are therefore more likely to _____blank

Which choice most logically completes the text?

A) extend the average lifespan of great egrets already in the area than they are to attract a greater number of those birds to the area.

B) attract birds that don't typically live in wetlands to the area than they are to attract great egrets or wood storks to the area.

C) **attract great egrets to the area than they are to attract wood storks to the area.**

D) decrease the area's appeal to both great egrets and wood storks than they are to increase the appeal to either.

Question 15

Filtration is a widely used method for removing microplastics—plastics with a width less than 5 millimeters (mm)—from waterways. However, filtration systems are typically unable to capture very small microplastics. Menake Piyasena and Nelum Perera designed a device that applies sound waves to water as it flows through a metal tube. The sound waves cause microplastics in the water to gather in the middle and along the sides of the tube. The microplastics can then be separated out by channeling polluted and clean water though different outlets. Testing indicated that the system removes even tiny microplastics, including ones as small as 10 microns, or 0.01 mm, wide. This result suggests that _____blank

Which choice most logically completes the text?

A) **the sound wave treatment system may help solve a problem associated with filtration of microplastics.**

B) combining filtration with sound waves is likely the most efficient method for removing microplastics from water.

C) directing water through filtration tubes with multiple outlets reduces microplastic pollution.

D) unlike sound waves, filters have the ability to remove large microplastics from polluted waterways.

Question 16

A senior data scientist at Apple, Kate Niehaus works on developing artificial intelligence technology, with a specific focus on trustworthy machine _____blank machine learning involves teaching computer algorithms to be accurate, safe, and fair.

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

A) learning trustworthy

B) **learning. Trustworthy**

C) learning, trustworthy

D) learning, which trustworthy

Question 17

The Tuskegee University Archives' collection includes an original 1957 photograph of Martin Luther King Jr. addressing a group of Tuskegee civil rights activists. Taken by P.H. Polk, the photo _____blank King in profile, the glow of a stage light casting his silhouette onto the curtains behind him.

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

A) showing

B) having shown

C) **shows**

D) to show

Question 18

Sociologist Alton Okinaka sits on the review board tasked with adding new sites to the Hawai'i Register of Historic Places, which includes Menehune Fishpond and the Wailuku School. However, Okinaka doesn't make such decisions _____blank all historical designations must be approved by a group of nine other experts from the fields of architecture, archaeology, history, and Hawaiian culture.

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

A) single-handedly,

B) **single-handedly;**

C) single-handedly and

D) single-handedly

Question 19

Most of the ice found on Earth is ice Ih, distinguished by a crystalline structure in which molecules form a hexagonal pattern. Amorphous ice, on the other hand, constitutes most of the ice in the ultrafrigid environment of outer space. Defined by a disorganized molecular structure, _____blank

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

A) ice Ih contains crystals, whereas amorphous ice, which lacks the thermal energy to form them, does not.

B) **amorphous ice lacks the thermal energy to form the crystals found in ice Ih.**

C) the lack of thermal energy in amorphous ice explains its inability to form the crystals found in ice Ih.

D) ice Ih differs from amorphous ice in that it possesses the thermal energy to form crystals.

Question 20

When, in 2018, scientists in Germany discovered a fossilized brittle star with three thick, spine-studded arms positioned opposite three thin, undeveloped ones, they found something never before seen in the fossil _____blank clonal fragmentation, a type of asexual reproduction, an animal splits itself in two, each half then regrowing its missing limbs—just what the brittle star was doing.

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

A) record. Evidence of cloning in

B) **record: evidence of cloning. In**

C) record—evidence of cloning in

D) record, evidence of cloning, in

Question 21

Typically, upon detecting the scent of another animal, a leopard will open its mouth. _____blank the leopard allows the scent to reach sensory receptors on the roof of its mouth. These sensors help the leopard interpret the source of the scent.

Which choice completes the text with the most logical transition?

A) On the other hand,

B) Nowadays,

C) However,

D) **By doing so,**

Question 22

While researching a topic, a student has taken the following notes:
- The human tongue contains taste receptors for a rich, savory flavor called umami.
- Umami is triggered by the compounds in a variety of foods, including anchovies and mushrooms.
- Participants in a study tasted a sample of sea palm, a type of brown seaweed.
- They rated its umami intensity as moderate.
- The participants tasted a sample of ma-konbu, another type of brown seaweed.
- They rated its umami intensity as high.

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

A) **Participants in a research study found sea palm, a type of brown seaweed, to have moderate umami intensity, while ma-konbu's umami was more intense.**

B) Both sea palm and ma-konbu are types of brown seaweed.

C) Sea palm and ma-konbu both contain umami flavor, which can also be triggered by compounds in anchovies and mushrooms.

D) Some types of brown seaweed, like sea palm and ma-konbu, trigger umami flavor in human taste buds.

Question 23

While researching a topic, a student has taken the following notes:
- NoViolet Bulawayo is an acclaimed writer.
- Her first published work of fiction was a short story.
- It was called "Hitting Budapest."
- It first appeared in *Boston Review* in 2010.

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

A) NoViolet Bulawayo's first published short story was called "Hitting Budapest."

B) In 2010, a short story by NoViolet Bulawayo appeared in *Boston Review*.

C) NoViolet Bulawayo's first published work of fiction appeared in 2010.

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

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

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

The student wants to provide an example of a sky island. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) Sky islands are isolated mountain ranges whose environments differ drastically from that of the surrounding lowlands; as the USFS puts it, "the mountains are 'islands' surrounded by deserts that are 'seas.'"

B) The USFS considers each of the sky islands, whose environments differ drastically from that of the surrounding lowlands, to be a "unique ecosystem."

C) In the southwestern US and northwestern Mexico, there are dozens of sky islands: isolated mountain ranges whose environments differ drastically from that of the surrounding lowlands.

D) **There are dozens of sky islands in the southwestern US and northwestern Mexico, such as the El Tigre Mountains.**

Question 25

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

- Ike Taiga (1723–1776) was a Japanese painter.
- Li Bai (701–762) was a Chinese poet.
- Taiga created the artwork titled *Landscape and Couplet of Chinese Verse*.
- The artwork is made up of two scrolls.
- Scroll 1 features a painting of a lone figure walking among tall, narrow mountains.
- Scroll 2 features a poem from Li Bai that is about being in nature.

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

A) Ike Taiga created *Landscape and Couplet of Chinese Verse*, which is made up of two scrolls that each depict nature.

B) Made up of two scrolls that each depict nature, *Landscape and Couplet of Chinese Verse* was created by Li Bai.

C) **In *Landscape and Couplet of Chinese Verse*, one scroll features a painting, while the other scroll features a poem.**

D) One of the two scrolls that make up *Landscape and Couplet of Chinese Verse* features mountains, and one features a portrait of poet Li Bai.

Question 26

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

- Dame Ellen McArthur is a British sailor who completed a true circumnavigation of the globe in 2001.
- One of the requirements of a true circumnavigation is that the journey must begin and end in the same port.
- McArthur's circumnavigation began and ended in the port of Les Sables d'Olonne, France.
- On her journey, McArthur passed the three great capes of the Southern Ocean.
- Her journey took 94 days.

The student wants to provide evidence that McArthur's journey was a true circumnavigation. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) To be considered a true circumnavigation, a journey must begin and end in the same port, and McArthur's lasted 94 days.

B) McArthur is a British sailor who completed a true circumnavigation that ended in Les Sables d'Olonne, France.

C) **McArthur began and ended her trip in the same port (Les Sables d'Olonne, France), one of the requirements for a true circumnavigation.**

D) A true circumnavigation, McArthur's journey also passed the three great capes of the Southern Ocean.

Question 27

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

- In the 1800s, some actors also managed theaters.
- They were known as actor-managers.
- William Charles Macready managed the Covent Garden Theatre (London) from 1837 to 1839.
- He starred in a production of *Henry V* there in 1838.
- Laura Keene managed Laura Keene's Theatre (New York) from 1856 to 1863.
- She starred in a production of *The Seven Sisters* there in 1860.

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

A) Macready managed a London theater, whereas Keene managed one in New York.

B) Both Macready and Keene were managers of the Covent Garden Theatre in London, where they also starred in various plays.

C) **As actor-managers, both Macready and Keene managed theaters where they also performed.**

D) In the 1800s, some actors (such as Keene) also managed theaters; they were thus considered actor-managers.

Section 1, Module 2: Reading and Writing

Question 1

Noah Fierer 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. Fierer 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) precluded

C) estimated

D) populated

Question 2

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 G.I. Joe action 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) exchange

B) forecast

C) avoid

D) monitor

Question 3

Derived from research conducted with factory workers from 1924 to 1933, the Hawthorne effect suggests that participants' awareness that they are being studied alters their behavior and influences study outcomes. Since then, several researchers have claimed to invalidate this phenomenon, positing that the Hawthorne effect cannot be _____blank because attempts to detect it invariably involve faulty research methods.

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

A) rectified

B) substantiated

C) inculcated

D) hypothesized

Question 4

Paleontologists think that *Ornithomimus*, *Phuwiangosaurus*, and other long-extinct theropods and sauropods may have breathed using air sacs connected to tubelike extensions inside the animals' bones. Such structures are found in modern birds, which is why some paleontologists treat the respiratory systems of birds as _____blank those of *Ornithomimus*, *Phuwiangosaurus*, and other theropods and sauropods.

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

A) harbingers of

B) proxies for

C) emissaries for

D) subordinates of

Question 5

Advancements like the emergence of glassmaking in Mesopotamia circa 3500 BCE are overemphasized in innovation studies, contributing to the idea that technological change always brings greater complexity. Research by Nathaniel Erb-Satullo reveals an important exception: gold metallurgy flourished in the Caucasus in the Bronze Age, but a steep drop during that time (circa 1500 BCE) in objects featuring gold filigree (in which fine threads of gold are arranged in intricate patterns) and other sophisticated goldsmithing techniques suggests that simpler processes supplanted advanced methods.

Which choice best describes the overall structure of the text?

A) It details the near-consensus among researchers in a particular field of study regarding how technology evolves and then indicates the controversial nature of a study challenging that broadly accepted view.

B) It advances a claim made by researchers in one academic field about the nature of technological change and then critiques a contrasting claim presented by a researcher from a related academic field.

C) It explains that a particular interpretation of technological development has been perpetuated in an academic field and then provides a counterexample demonstrating that the interpretation isn't always accurate.

D) It summarizes the findings of several studies into the origins of a particular invention and then presents additional evidence from a more recent study that contradicts those findings.

Question 6

In their study of the steering muscles regulating sclerites (minute hardened structures) in the *Drosophila* (fruit fly) wing hinge, Johan M. Melis et al. used machine learning to devise a convolutional neural network (CNN) model capable of predicting the pattern of wing motion produced by the maximum activity of the muscles. The CNN model's output aligned with results of prior studies by other researchers measuring muscle activity patterns directly—one of several indications, said Melis et al., that the model accurately represents important biomechanical processes underlying wing motion.

Which choice best states the main purpose of the text?

A) To present evidence from Melis et al.'s study in support of the efficacy of their CNN model

B) To compare results obtained by Melis et al. using their CNN model to prior results obtained from other researchers' models

C) To account for Melis et al.'s reliance in their study on a CNN model in lieu of direct measurement

D) To provide an overview of how Melis et al. honed the accuracy of their CNN model

Question 7

The following text is from Julia Alvarez's 2000 novel *In the Name of Salomé.* The narrator and her sister, daughters of a famous poet, are being tutored by Alejandro Román.

Our tutor, Alejandro Román, brought his younger brother, Miguel, to class one day. By now I was eighteen and had learned everything Alejandro had to teach me, so I was glad for a new face. Miguel was an aspiring poet, and he had heard from his brother that the Ureña girls were none other than the daughters of Nicolás Ureña, and they were smart as clockwork. Miguel was hoping not only to meet us but to make the acquaintance of the poet himself at Mamá's house.

©2000 by Julia Alvarez

Based on the text, why does Miguel accompany his brother to the sisters' house one day?

A) Miguel's brother has shared with him all the knowledge he has, and Miguel wants to learn from the sisters now.

B) Miguel wishes to share his poems with the sisters and ask them for feedback on his writing.

C) Miguel anticipates having the opportunity to be introduced to both the sisters and their father.
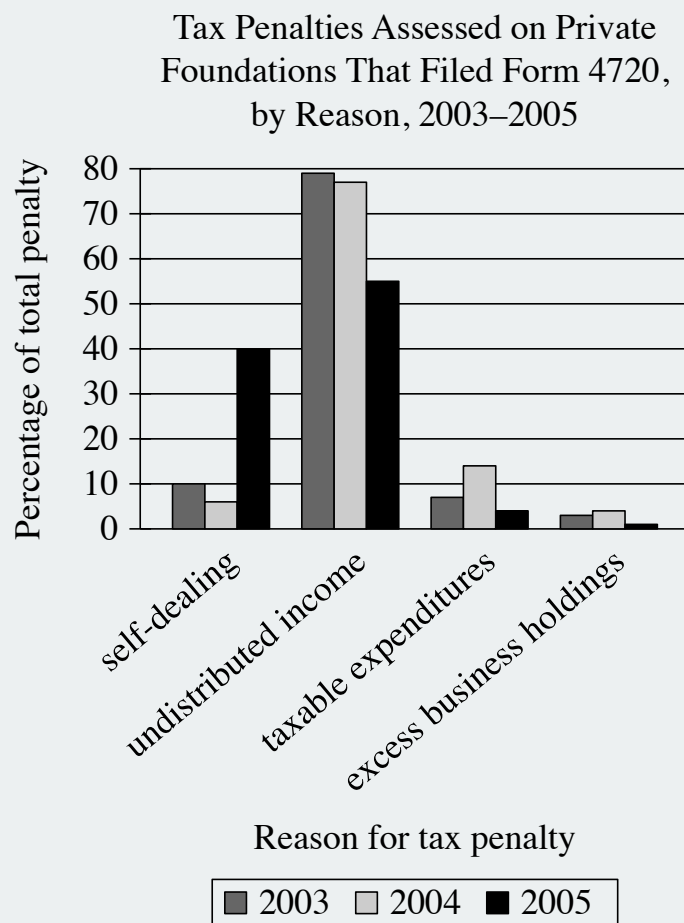
D) Miguel has not received formal instruction in poetry and wants to ask the sisters' famous father to be his mentor.

Motivated to sell as many paintings as possible, Alfred Hair, an influential figure among the landscape artists known as the Florida Highwaymen, pioneered "fast painting," which in part involved swift applications of paint. That many of Hair's acolytes, including Livingston Roberts, imitated the technique accounts in part for the impressionistic qualities that are now synonymous with the group's shared aesthetic. But not all Highwaymen fully embraced this approach; for instance, though Charles Walker was also prolific, his paintings were executed with greater attention to detail.

What does the text most strongly suggest about paintings by Roberts?

A) Roberts's reliance on the technique of fast painting likely accounts for his works being more aesthetically interesting than works by Walker are.

B) Although it is evident that Roberts adopted some of Hair's preferred techniques, Roberts's works are less derivative of works by Hair than is typically acknowledged.

C) The lack of precision with which they were executed suggests that they are inferior to works by either Hair or Walker.

D) Because of the manner in which they were created, they likely have visual qualities that are regarded as more typical of Florida Highwaymen paintings than the qualities in works by Walker are.

Tax Penalties Assessed on Private
Foundations That Filed Form 4720,
by Reason, 2003–2005

Reason for tax penalty

- For each data category, the following bars are shown:
- 2003
- 2004
- 2005
- The data for the 4 categories are as follows:
- self-dealing:
  - 2003: 10%
  - 2004: 6%
  - 2005: 40%
- undistributed income:
  - 2003: 79%
  - 2004: 77%
  - 2005: 55%
- taxable expenditures:
  - 2003: 7%
  - 2004: 14%
  - 2005: 4%
- excess business holdings:
  - 2003: 3%
  - 2004: 4%
  - 2005: 1%

While US public charities, like Kaiser Foundation Hospitals, must file Form 990 yearly with the IRS, private foundations, such as the Gordon and Betty Moore Foundation, must file a different form, 990-PF. In addition, foundations that engage in certain prohibited activities must also file Form 4720 and pay a penalty tax on the money involved. Private foundations are prohibited from holding excess interests in a business enterprise, "self-dealing" (conducting activities that benefit foundation insiders), making taxable expenditures such as outlays for lobbying, and failing to cross a required threshold in making charitable distributions from income. Out of the organizations that filed Form 990-PF in the years 2003–2005, _____blank

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

A) those that also filed Form 4720 paid a larger penalty for failing to meet a minimum charitable distribution requirement than those organizations that filed Form 990 but also filed Form 4720 for the same reason.

B) a smaller percentage of those that also filed Form 4720 did so because they held excess interests in a business enterprise than the percentage of those that filed Form 4720 because they did not meet the minimum charitable distribution requirement.

C) those that were also required to file Form 4720 because they had excess holdings in a business enterprise paid, on average, a larger penalty than those organizations that filed Form 4720 because they made taxable expenditures.

D) those that also filed Form 4720 collectively paid larger penalties for failing to meet the minimum charitable distribution requirement than for other reasons.

Question 10

Blandine Courel and her colleagues analyzed pottery fragments from thirty-five sites across the Volga and Don river basins to determine whether the ways in which hunter-gatherer societies used pottery in these regions around 6,500–8,000 years ago were influenced primarily by local food availability or primarily by cultural factors. Analysis of organic residues on the pottery fragments showed different prevailing uses for pottery in these locations—cooking and storing terrestrial animal protein at Volga sites and cooking and storing aquatic animal protein at Don sites—which Courel and colleagues attribute to cultural differences.

Assuming that the Volga and Don basins supported similarly sized hunter-gatherer populations 6,500–8,000 years ago, which finding, if true, would most directly support Courel and colleagues' explanation?

A) The people of the Volga basin acquired the techniques used to create pottery for cooking and storing food from the people of the Don basin.

B) Across the Volga and Don basins, people had broadly similar access to the same terrestrial and aquatic animal resources.

C) There were many more bodies of water in a comparably sized area in the Don basin than in the Volga basin.

D) In both the Volga and Don basins, most of the sites from which pottery has been recovered appear to have been seasonal fishing and hunting encampments rather than year-round settlements.

Question 11

To boost the performance of oil-absorbing resins, which are used to remove oil and other organic compounds from wastewater, one team of materials researchers created a resin with a novel—albeit very expensive—monomer (a molecule that can chemically bond with analogous molecules to form polymers) synthesized from β-cyclodextrin. Other researchers have produced resins consisting of various much cheaper, commercially available methacrylate monomers, including one derived from benzyl methacrylate (BZMA). Testing all these resins' capacity to absorb toluene and trichloromethane, two organic compounds, a scientist concluded that when practical considerations were taken into account, the BZMA-derived resin showed the greatest potential for use in wastewater cleanup.

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

A) For both toluene and trichloromethane, the BZMA-derived resin exhibited only modestly lower absorption capacity than the resin synthesized from β-cyclodextrin but higher absorption capacity than other resins consisting of commercially available methacrylate monomers.

B) Relative to the resin synthesized from β-cyclodextrin and to other resins consisting of commercially available methacrylate monomers, the BZMA-derived resin exhibited superior absorption capacity for toluene but not for trichloromethane.

C) Whereas the resin synthesized from β-cyclodextrin exhibited the highest absorption capacity for toluene, the BZMA-derived resin and other resins consisting of commercially available methacrylate monomers exhibited the highest absorption capacity for trichloromethane.

D) For both toluene and trichloromethane, the BZMA-derived resin exhibited similar absorption capacity as other resins consisting of commercially available methacrylate monomers and a slightly higher absorption capacity than the resin synthesized from β-cyclodextrin.

Northern New York's Hamilton County is among the most rural counties in the United States: the US Census Bureau classified it as 100% rural in 2010. Researchers often struggle to recruit residents of counties like Hamilton for inclusion in studies. Melissa Valerio and colleagues tested whether an approach called snowball sampling improves recruitment. Working in two rural counties, they recruited a few people (known as "seeds") with the characteristics desired for a proposed study and asked them to recruit additional participants from their social networks. Though the seeds were given minimal guidance, many more people they recruited had the desired characteristics for the study than would be expected by chance alone, most likely because _____blank

Which choice most logically completes the text?

A) the characteristics that made the seeds desirable for inclusion in the proposed study may be unknown to some members of the seeds' social networks.

B) most seeds' social networks include some people who do not know one another and who share few characteristics.

C) the seeds' social networks tend to be somewhat smaller than the networks of people who do not live in rural areas.

D) the seeds' social networks include a high proportion of people who share characteristics with the seeds.

Question 13

In classical Greek and Roman mythology, female characters are typically cast as either villains lacking in psychological depth or passive victims who are marginal to these stories, which usually focus on the exploits of male characters. Recently, a subgenre has emerged in which writers reimagine these stories from the perspectives of their female characters, giving them agency and complex motivations. Purists argue that such efforts represent a distinctively modern tendency to impose our own values on past civilizations, obscuring those civilizations' beliefs. Defenders of the subgenre counter that reimaginings of the myths for new cultural contexts are almost as old as the myths themselves, suggesting that _____blank

Which choice most logically completes the text?

A) bringing female perspectives to the forefront is not indicative of a novel attitude regarding fidelity to Greek and Roman myths' ideologies.

B) the complex motivations given to female characters in modern retellings of Greek and Roman myths reflect a recent shift toward psychological depth in fictional representation.

C) purists are overlooking a long tradition of adapting Greek and Roman myths to focus on female characters.

D) modern writers' foregrounding of female characters is chiefly motivated by a desire to counterbalance the primacy of male perspectives among earlier adaptations of Greek and Roman myths.

Question 14

The world's many geothermal power plants leverage an array of _____blank the Hellisheiði plant uses a flash steam system that transforms high-temperature geothermal fluid into steam; in Indonesia, the Darajat plant's dry steam system pumps superheated steam from a reservoir; and in Turkey, the Pamukoren plant's binary cycle system uses lower-temperature geothermal fluid in conjunction with a secondary fluid.

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

A) technologies, in Iceland,

B) technologies in Iceland:

C) technologies: in Iceland,

D) technologies in Iceland;

Question 15

When a given term—"self-fulfilling prophecies" and "role models" are two well-known examples—is generally accepted and frequently used, _____blank susceptible to obliteration by incorporation (OBI). In cases of OBI, widely used terms are rarely, if at all, attributed to the individuals who coined them.

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

A) they often become

B) this often becomes

C) it often becomes

D) these often become

Question 16

In ancient Rome, salt was used as a commodity currency. By using specific goods like salt as common units of exchange, commodity currency economies streamline trade, which is why they often replaced barter economies. Barter economies eschew _____blank that requires what economist W.S. Jevons deems a "double coincidence of wants"—in other words, each trading party must want precisely what the other has.

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

A) currency in favor of a direct trade system

B) currency—in favor of a direct trade system

C) currency, in favor of a direct trade system

D) currency, in favor of a direct trade system,

Question 17

In their attempt to create a quantum random number generator, K. Muhammed Shafi et al. used a continuous-wave diode laser to fire photons at a periodically-poled potassium titanyl phosphate (PPKTP) nonlinear crystal. A plano-convex lens _____blank the laser on the center of the 10-millimeter-long crystal ensured a spot size (a measure of the beam's diameter) of 85 micrometers.

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

A) focused

B) focus

C) focuses

D) focusing

Question 18

For her installation *The Last Cruze*, photographer LaToya Ruby Frazier traveled to Lordstown, Ohio, where she documented the lives of workers at the local automobile plant. In the installation, text culled from a series of in-depth interviews with employees and their families _____blank sixty-seven gelatin silver prints, highlighting the collaborative, documentary nature of Frazier's work.

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

A) punctuates

B) punctuate

C) punctuating

D) are punctuated by

A single specimen of *G. hexagonus,* collected at a depth of 483 fathoms (884 meters) in the Pacific Ocean, and a single specimen of *G. rubescens,* collected at a depth of 769 fathoms (1,407 meters) in the Indian Ocean, 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 the Netherlands' Naturalis Biodiversity Center.

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

Writing in hieroglyphs, ancient Egyptians recorded measurements using units such as the *sa,* a unit of _____blank and the *khar,* a unit of volume. The *sa,* for instance, is written as a hieroglyph that looks like a duck or goose.

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

A) area; the *shesep*, a unit of length;

B) area; the *shesep*; a unit of length;

C) area the *shesep*, a unit of length

D) area, the *shesep*; a unit of length,

Question 21

While most animals prefer the safety of nighttime migration, many poisonous amphibians—a category that includes the striped newt and the Asian common toad—safely engage in migratory behavior during the day. _____blank with the sun in the sky, the amphibians' striking color patterns deter visually oriented daytime predators by serving as a warning of toxicity.

Which choice completes the text with the most logical transition?

A) At that time,

B) In other words,

C) However,

D) For example,

Question 22

In a given rock formation, Chattian rock from 27.8 million years ago might directly abut Roadian rock from 273 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) As a result,

B) On the contrary,

C) Of course,

D) In particular,

Question 23

Architect Victor Gruen, the designer of Indiana's Woodmar Plaza shopping mall, conceived of the mall as an indoor version of the European town square, a communal space that encouraged visitors to stroll and linger. _____blank he designed Woodmar Plaza with long, pedestrian-friendly promenades and ample seating areas clustered around fountains and greenery.

Which choice completes the text with the most logical transition?

A) In addition,

B) Regardless,

C) Accordingly,

D) By contrast,

Question 24

Long thought to be sessile (immobile), adult *Chelonibia testudinaria,* barnacles that adhere to sea turtle shells, have been observed to shift slightly in position over time—a phenomenon that has been attributed to the barnacles' passive displacement by water currents. _____blank a research team found that adult *C. testudinaria* moved toward the heads of their sea turtle hosts and thus against the prevailing water flow, behavior consistent with self-initiated locomotion.

Which choice completes the text with the most logical transition?

A) Confirming this hypothesis,

B) Drawing a similar conclusion,

C) Undermining this explanation,

D) Contrary to this phenomenon,

Question 25

In Annie Dillard's *Pilgrim at Tinker Creek*—where, early on, the author marvels at a single goldfish's delicate fins but later winces when imagining a horde of goldfish laying and eating their own eggs—Dillard struggles to reconcile the complicated juxtapositions of the natural world. _____blank nature's mesmerizing intricacy and pitiless harshness prove inextricably linked for Dillard, like "two branches of the same creek."

Which choice completes the text with the most logical transition?

A) To that end,

B) Hence,

C) Ultimately,

D) Moreover,

Question 26

- Silent films can be valuable historical documents of their time
- . Ninety percent of silent films made before 1930 are now lost.
- A film is considered lost when no remaining copies are known to exist
- . Director Richard Thorpe's 1929 silent film *The Fatal Warning* is lost.
- Director Oscar Micheaux's 1920 silent film *Within Our Gates* is archived at the UCLA Film Television Archive in Los Angeles, California.

Which choice most effectively uses information from the given sentences to emphasize a difference between the two movies?

A) Richard Thorpe's 1929 film *The Fatal Warning* is among the many lost films of the era.

B) Richard Thorpe's *The Fatal Warning* (1929) and Oscar Micheaux's *Within Our Gates* (1920) are just two examples of silent films from the 1920s.

C) While Richard Thorpe's *The Fatal Warning* is considered lost to history, Oscar Micheaux's film *Within Our Gates* is archived at the UCLA Film Television Archive in Los Angeles, California.

D) Oscar Micheaux's film *Within Our Gates* can be found at the UCLA Film Television Archive in Los Angeles, California.

Question 27

While researching a topic, a student has taken the following notes:
- Founded in 2011, EMOTIV is a neurotechnology company that develops brain-computer interfaces (BCIs).
- BCIs interpret and execute brain signals to allow users to control external software or hardware with their thoughts.
- Founded in 2013, Saluda Medical is a neurotechnology company that develops neuromodulation technologies.
- Neuromodulation technologies use neural interfaces to stimulate nervous system structures and influence neural activity.
- Founded in 2009, BrainGate is a neurotechnology company that develops neuroprostheses.
- Neuroprostheses act as replacement brain functions to restore the user's lost sensory, motor, or neural functions.

The student wants to contrast the type of neurotechnology EMOTIV develops with the type of neurotechnology Saluda Medical develops. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) Unlike Saluda Medical, which develops neurotechnology, EMOTIV develops BCIs.

B) BCIs interpret and execute brain signals to allow users to control external software or hardware with their thoughts, whereas neuromodulation technologies restore sensory, motor, or neural functions.

C) Founded in 2011, EMOTIV develops technology for interpreting and executing brain signals, which, unlike Saluda Medical and BrainGate, is categorized as a neuromodulation technology.

D) BCIs allow users to control external software or hardware with their thoughts, but they don't influence neural activity as neuromodulation technologies do.

Section 2, Module 1: Math

Question 1

The number of muskrat in a 115-acre area is estimated to be $2{,}070$. What is the estimated population density, in muskrat per acre, of this area?
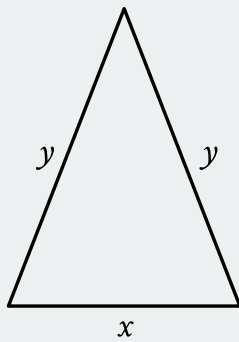
A) 18

B) 2,088

C) 115

D) 133

Question 2

Note: Figure not drawn to scale.

The triangle shown has one side with a length of x inches and two sides each with a length of y inches. The perimeter of the triangle is 63 inches. Which equation represents this situation?

A) $2x + y = 63$

B) $x + 2y = 63$

C) $2x + 2y = 63$

D) $x + y = 63$

Question 3

A jar has 170 buttons, and 20% of these buttons are green. How many buttons in the jar are green?

Answer:

34

Question 4

There are a total of $3,500$ milligrams of phosphorus in a sample of soil. Each kilogram of this sample contains 700 milligrams of phosphorus. Which equation represents this situation, where x is the mass, in kilograms, of the sample of soil?

A) $3,500x = 700$

B) $x + 3,500 = 700$

C) $x + 700 = 3,500$

D) $700x = 3,500$

Question 5

The function f is defined by $f(x) = \frac{1}{2}(x + 11)$. What is the value of $f(3)$?

A) 22

B) 28

C) 7

D) 14

Question 6

If $7x + 5 = 22$, what is the value of $2(7x + 5)$?

A) 34

B) 66

C) 44

D) 54

Question 7

Triangles ABC and DEF are congruent, where A corresponds to D, and B and E are right angles. The measure of angle A is $63°$. What is the measure, in degrees, of angle F?

Answer:

27

Question 8

A savings account is opened with an initial deposit of $9,000. The amount of money in the account t years after the initial deposit is given by the function $f(t) = 9{,}000(1.02)^{2t}$. Which of the following is the best interpretation of the statement "$f(9)$ is approximately equal to $12{,}854.22$" in this context?

A) Every 9 years, the amount of money, in dollars, in the account increases by $12{,}854.22$.

B) **9 years after the initial deposit, the amount of money, in dollars, in the account is $12{,}854.22$.**

C) 9 years after the initial deposit, the amount of money, in dollars, in the account has increased by $12{,}854.22$.

D) Every 9 years, the amount of money, in dollars, in the account decreases by $12{,}854.22$.

Question 9

$$y = (x - 7)(x + 3)$$

Which table gives four values of x and the corresponding values of y for the given quadratic equation?

A)

x	-1	0	1	2
y	11	3	-3	-7

B)

x	-1	0	1	2
y	-28	-21	-14	-7

C)

x	-1	0	1	2
y	-16	-21	-24	-25

D)

x	-1	0	1	2
y	3	10	17	24

Question 10

In the linear function f, $f(0) = 9$ and $f(7) = 9$. Which equation defines f?

A) $f(x) = 9$

B) $f(x) = x + 9$

C) $f(x) = 7$

D) $f(x) = 0$

Question 11

A length of 550 meters is equal to how many **decimeters**? (1 meter $= 10$ decimeters)

Answer:

5500

Question 12

An arborist studying forestland in Illinois estimates that there are at least 40 and no more than 70 hickory trees per acre in a certain forest. Which of the following best represents the arborist's estimate of the number of hickory trees, x, that are in a 7-acre section of this forest?

A) $490 \leq x \leq 980$

B) $280 \leq x \leq 490$

C) $47 \leq x \leq 77$

D) $40 \leq x \leq 70$

Question 13

For the polynomial function p, the graph of $y = p(x)$ in the *xy*-plane crosses through the points $(-6, 0)$, $(0, 12)$, $(7, 0)$, and $(14, 0)$. What is the value of $p(0)$?

Answer:

12

Question 14

The graph of $-11x + 2.2y = -605$ in the *xy*-plane has intercepts at $(a, 0)$ and $(0, b)$. What is the value of ab?

Answer:

-15125

$$x + 21y = 38$$

$$4x + 3y = 17$$

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

Answer:

1.666

As part of a study on sedimentary habitats, the water temperature was recorded at different depths below the surface of the water in the northern Alboran Sea. The data shown in the scatterplot give the recorded temperature, in degrees Celsius, for 7 depths, in meters, below the surface of the water.
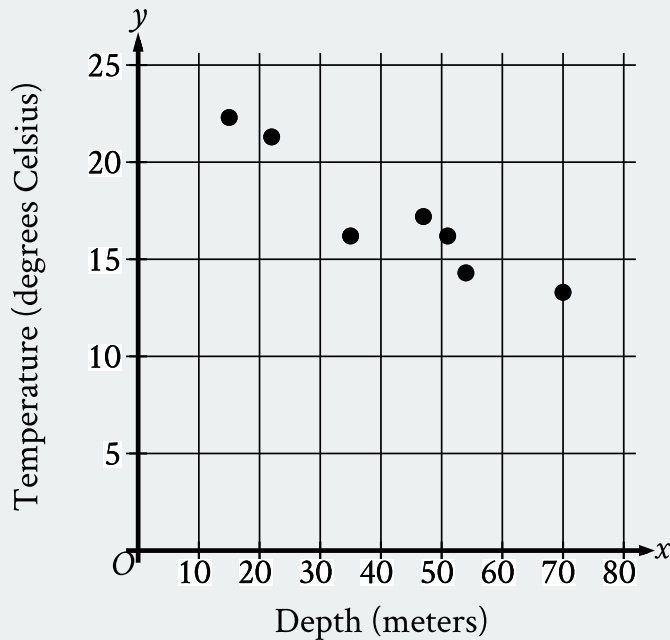
- The scatterplot has 7 data points.

- The data points are in a linear pattern trending down from left to right.

- The data points have the following approximate coordinates:

- (15 comma 22.30)

- (22 comma 21.30)

- (35 comma 16.20)

- (47 comma 17.20)

- (51 comma 16.20)

- (54 comma 14.30)

- (70 comma 13.30)

Which of the following is closest to the slope of a line of best fit for the data shown?

A) −8.05

B) −0.17

C) −6.05

D) −2.17

Question 17

$$a = \frac{4}{9}b + 8$$

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

A) $b = \frac{9}{4}a - 18$

B) $b = \frac{4}{9}a - 18$

C) $b = \frac{9}{4}a - 8$

D) $b = \frac{4}{9}a + 8$

The measure of an angle, in radians, is $(99)(2)\pi$. **What is the measure of the angle, in <u>degrees</u>?**

A) $(99)(2)(360)$

B) $\left(\frac{99}{2}\right)(360)$

C) $(180)(99)(360)$

D) $(99)(360)$
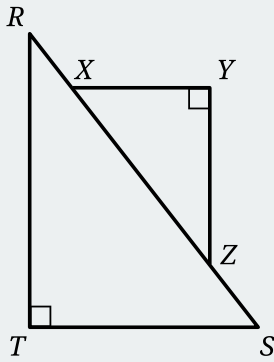
$$x^2 + \left(\sqrt{k-3}\right)x + 26 = 0$$

In the given equation, k is a constant. The equation has exactly one real solution. What is the value of k?

A) 29

B) 104

C) 107

D) 101

Note: Figure not drawn to scale.

- **Right triangle upper R upper S upper T is labeled as follows:**

- **Angle upper T is a right angle.**

- **Right triangle upper X upper Y upper Z is labeled as follows:**

- **Angle upper Y is a right angle.**

- **Point upper X and point upper Z lie on side upper R upper S of triangle upper R upper S upper T.**

- **Vertex upper Y of triangle upper X upper Y upper Z is outside of triangle upper R upper S upper T.**

- **A note indicates the figure is not drawn to scale.**

In triangles RST and XYZ shown, $\overline{XY}$ is parallel to $\overline{TS}$ and $\tan R = \frac{180}{299}$. What is the value of $\sin X$ in triangle XYZ?

A) $\frac{299}{349}$

B) $\frac{180}{349}$

C) $\frac{180}{479}$

D) $\frac{299}{180}$

Question 21

$$|x + 4| + 4 = |2x - 11| + 4$$

What is the smallest solution to the given equation?

Answer:

2.333

Question 22

$$y = 3x^2 - 12x + 18$$
$$y + 2 = 0$$

How many solutions are there to the given system of equations?

A) There are exactly 2 solutions.

B) There are exactly 3 solutions.

C) There are no solutions.

D) There is exactly 1 solution.

Section 2, Module 2: Math

Question 1

In triangle EFG, the sum of the measures of angles E and F is $22°$. What is the measure of angle G?

A) $158°$

B) $136°$

C) $68°$

D) $22°$

Question 2

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

A) 83, 84, 85, 86, 87

B) 84, 85, 85, 85, 86

C) 83, 83, 85, 87, 87

D) 82, 83, 85, 87, 88

Question 3

$$y = (x - 25)(x - 75)$$
$$y = 0$$

The graphs of the equations in the given system of equations intersect at the point (x, y) in the *xy*-plane. What is a possible value of x?

A) 75

B) 100

C) 3

D) 0

The cost to rent a kayak consists of a fixed fee for the first hour and an hourly fee for each additional hour. The table shows the rental cost for 2 hours and for 4 hours.

Rental hours	Rental cost (dollars)
2	65
4	125

Which function f gives the rental cost, in dollars, for x hours rental, where $x \geq 1$?

A) $f(x) = 30x + 5$

B) $f(x) = 35x$

C) $f(x) = 30x + 65$

D) $f(x) = 30x$

$$g(x) = (38 - 2x)(32 + 2x)$$

The function g is defined by the given equation. For what value of x does $g(x)$ reach its maximum?

A) 3

B) 35

C) 1.5

D) 17.5

Rectangle X has a length of 24 millimeters (mm) and a width of 7.5 mm. Right triangle Y has a base of 60 mm. The area of rectangle X is 3 times the area of right triangle Y. What is the height, in mm, of right triangle Y?

A) 6

B) 2

C) 3

D) 1

x	y
0	n
4	$n+21$
8	$n+42$

There is a linear relationship between x and y. The table shows three values of x and their corresponding values of y in terms of a constant n. What is the slope of the line in the xy-plane that represents this relationship?

A) 21

B) 2

C) $\frac{21}{4}$

D) $\frac{1}{2}$

Question 8

If $a = 5k + 6r$ and $b = 8k - 11r + 3$, which expression is equivalent to $a - b$?

A) $-3k + 17r + 3$

B) $-3k - 5r - 3$

C) $-3k + 17r - 3$

D) $-3k - 5r + 3$

Question 9

An exponential function f is defined by $f(x) = c^x$, where c is a constant greater than 1. If $f(6) = 25 \cdot f(4)$, what is the value of c?

Your Response:

Enter your answer here...

Question 10

The function g is defined by $g(x) = 18x + 31$. For what value of x does $g(x) = 34$?

Your Response:

Enter your answer here...

Question 11

The equation $h = \frac{9(v-273.15)}{5} + 32$ gives the corresponding temperature h, in degrees Fahrenheit, of any substance that has a temperature of v kelvins, where $v > 0$. If a substance has a temperature of 845.33 degrees Fahrenheit, what is the corresponding temperature, in kelvins, of this substance?

Your Response:

Enter your answer here...

Question 12

$$25x^2 + 10\sqrt{39}x + p = 0$$

In the given equation, p is a constant. The equation has exactly one real solution. What is the value of p?

A) $\sqrt{39}$

B) $2\sqrt{39}$

C) $\frac{39}{2}$

D) 39

$$f(x) = 2{,}570(0.28)^{\frac{x}{12}}$$

The function f gives the value, in dollars, of a certain piece of equipment after x months of use. If the value of the equipment decreases each <u>year</u> by $p\%$ of its value the preceding year, what is the value of p?

A) 10

B) 28

C) 72

D) 2

In triangle RST, $RS = ST$ and the length of $\overline{RT}$ is 48 units. If $\tan R = \frac{7}{24}$, what is the area, in square units, of triangle RST?

A) 168

B) 288

C) 84

D) 336

An equilateral triangle has a height of $21\sqrt{3}$ units. What is the length, in units, of one side of this triangle?

A) 42

B) $21\sqrt{3}$

C) $42\sqrt{3}$

D) 21

Which expression is **NOT** a factor of $1{,}440x^4 - 56{,}250$?

A) 90

B) $4x^2 + 25$

C) $2x^2 - 5$

D) $2x + 5$

$$2,970x = 5,940x$$

How many solutions does the given equation have?

A) Infinitely many

B) Exactly two

C) Zero

D) Exactly one

In the *xy*-plane, line r passes through the points $(3, 12)$ and $(7, 13)$. Line s passes through the point $(1, 2)$ and is perpendicular to line r. An equation of line s is $ax + 7y = c$, where a and c are constants. What is the value of c?

Your Response:

Enter your answer here...

Question 19

For 100 neurons, the table summarizes the distribution of classification and cell body diameter.

Classification	Cell body diameter (micrometers)		
	Less than 20	20 to 30	Greater than 30
Sensory neuron	12	7	4
Motor neuron	0	17	18
Interneuron	10	32	0

One of these neurons will be selected at random. What is the probability of selecting a neuron with a cell body diameter that is less than or equal to 30 micrometers, given that it is **not** classified as a motor neuron? (Express your answer as a decimal or fraction, not as a percent.)

Your Response:

Enter your answer here...

Question 20

The value of a painting increased by 179% from the end of 2017 to the end of 2018 and then decreased by 27% from the end of 2018 to the end of 2019. What was the net percentage increase in the value of the painting from the end of 2017 to the end of 2019?

A) 254.33%

B) 152.00%

C) 130.67%

D) 103.67%

$$7x + 8y = 3$$

The given equation is one equation in a system of two linear equations. If the system of equations has at least one solution, which of the following equations could be the other equation in the system?
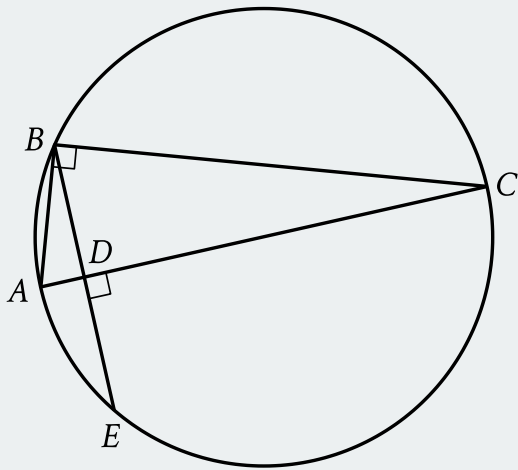
I. $10.5x + 12y = 4.5$

I. $10.5x - 12y = 4.5$

A) II only

B) Neither I nor II

C) I and II

D) I only

Note: Figure not drawn to scale.

- Points upper A, upper B, upper C, and upper E are on the circle.

- Right triangle upper A upper B upper C is inscribed in the circle.

- Angle upper A upper B upper C is a right angle.

- Line segment upper B upper E is a chord of the circle.

- Line segment upper B upper E intersects line segment A upper C at point upper D.

- Angle upper C upper D upper E is a right angle.

- A note indicates the figure is not drawn to scale.

In the figure shown, points A, B, C, and E lie on the circle, and $AB < BC$. Segment AC is perpendicular to segment BE at point D, and $BD = \sqrt{390}$. The diameter of the circle is 197. If $\frac{CD}{AD} = r$, what is the value of r?

Your Response:

Enter your answer here...