

**The SAT®**

# Practice Test #1

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# Reading and Writing

## 27 QUESTIONS

### DIRECTIONS

The questions in this section address a number of important reading and writing skills. Each question includes one or more passages, which may include a table or graph. Read each passage and question carefully, and then choose the best answer to the question based on the passage(s).

All questions in this section are multiple-choice with four answer choices. Each question has a single best answer.

1

Researchers and conservationists stress that biodiversity loss due to invasive species is \_\_\_\_\_. For example, people can take simple steps such as washing their footwear after travel to avoid introducing potentially invasive organisms into new environments.

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

- A) preventable
- B) undeniable
- C) common
- D) concerning

2

It is by no means \_\_\_\_\_ to recognize the influence of Dutch painter Hieronymus Bosch on Ali Banisadr's paintings; indeed, Banisadr himself cites Bosch as an inspiration. However, some scholars have suggested that the ancient Mesopotamian poem *Epic of Gilgamesh* may have had a far greater impact on Banisadr's work.

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

- A) substantial
- B) satisfying
- C) unimportant
- D) appropriate

3

Astronomers are confident that the star Betelgeuse will eventually consume all the helium in its core and explode in a supernova. They are much less confident, however, about when this will happen, since that depends on internal characteristics of Betelgeuse that are largely unknown. Astrophysicist Sarafina El-Badry Nance and colleagues recently investigated whether acoustic waves in the star could be used to determine internal stellar states but concluded that this method could not sufficiently reveal Betelgeuse's internal characteristics to allow its evolutionary state to be firmly fixed.

Which choice best describes the function of the second sentence in the overall structure of the text?

- A) It explains how the work of Nance and colleagues was received by others in the field.
- B) It presents the central finding reported by Nance and colleagues.
- C) It identifies the problem that Nance and colleagues attempted to solve but did not.
- D) It describes a serious limitation of the method used by Nance and colleagues.

The mimosa tree evolved in East Asia, where the beetle *Bruchidius terrenus* preys on its seeds. In 1785, mimosa trees were introduced to North America, far from any *B. terrenus*. But evolutionary links between predators and their prey can persist across centuries and continents. Around 2001, *B. terrenus* was introduced in southeastern North America near where botanist Shu-Mei Chang and colleagues had been monitoring mimosa trees. Within a year, 93 percent of the trees had been attacked by the beetles.

Which choice best describes the function of the third sentence in the overall structure of the text?

- A) It states the hypothesis that Chang and colleagues had set out to investigate using mimosa trees and *B. terrenus*.
- B) It presents a generalization that is exemplified by the discussion of the mimosa trees and *B. terrenus*.
- C) It offers an alternative explanation for the findings of Chang and colleagues.
- D) It provides context that clarifies why the species mentioned spread to new locations.

### Text 1

When companies in the same industry propose merging with one another, they often claim that the merger will benefit consumers by increasing efficiency and therefore lowering prices. Economist Ying Fan investigated this notion in the context of the United States newspaper market. She modeled a hypothetical merger of Minneapolis-area newspapers and found that subscription prices would rise following a merger.

### Text 2

Economist Dario Focarelli and Fabio Panetta have argued that research on the effect of mergers on prices has focused excessively on short-term effects, which tend to be adverse for consumers. Using the case of consumer banking in Italy, they show that over the long term (several years, in their study), the efficiency gains realized by merged companies do result in economic benefits for consumers.

Based on the texts, how would Focarelli and Panetta (Text 2) most likely respond to Fan's findings (Text 1)?

- A) They would argue that over the long term the expenses incurred by the merged newspaper company will also increase.
- B) They would recommend that Fan compare the near-term effect of a merger on subscription prices in the Minneapolis area with the effect of a merger in another newspaper market.
- C) They would encourage Fan to investigate whether the projected effect on subscription prices persists over an extended period.
- D) They would claim that mergers have a different effect on consumer prices in the newspaper industry than in most other industries.

The following text is from Jane Austen's 1811 novel *Sense and Sensibility*. Elinor lives with her younger sisters and her mother, Mrs. Dashwood.

Elinor, this eldest daughter, whose advice was so effectual, possessed a strength of understanding, and coolness of judgment, which qualified her, though only nineteen, to be the counsellor of her mother, and enabled her frequently to counteract, to the advantage of them all, that eagerness of mind in Mrs. Dashwood which must generally have led to imprudence. She had an excellent heart;—her disposition was affectionate, and her feelings were strong; but she knew how to govern them: it was a knowledge which her mother had yet to learn; and which one of her sisters had resolved never to be taught.

According to the text, what is true about Elinor?

- A) Elinor often argues with her mother but fails to change her mind.
- B) Elinor can be overly sensitive with regard to family matters.
- C) Elinor thinks her mother is a bad role model.
- D) Elinor is remarkably mature for her age.

The following text is adapted from Charles W. Chesnutt's 1901 novel *The Marrow of Tradition*.

Mrs. Ochiltree was a woman of strong individuality, whose comments upon her acquaintance[s], present or absent, were marked by a frankness at times no less than startling. This characteristic caused her to be more or less avoided. Mrs. Ochiltree was aware of this sentiment on the part of her acquaintance[s], and rather exulted in it.

Based on the text, what is true about Mrs. Ochiltree's acquaintances?

- A) They try to refrain from discussing topics that would upset Mrs. Ochiltree.
- B) They are unable to spend as much time with Mrs. Ochiltree as she would like.
- C) They are too preoccupied with their own concerns to speak with Mrs. Ochiltree.
- D) They are likely offended by what Mrs. Ochiltree has said about them.

The following text is adapted from William Shakespeare's 1609 poem "Sonnet 27." The poem is addressed to a close friend as if he were physically present.

Weary with toil, I [hurry] to my bed,  
The dear repose for limbs with travel tired;  
But then begins a journey in my head  
To work my mind, when body's work's expired:  
For then my thoughts—from far where I abide—  
[Begin] a zealous pilgrimage to thee,  
And keep my drooping eyelids open wide,

What is the main idea of the text?

- A) The speaker is asleep and dreaming about traveling to see the friend.
- B) The speaker is planning an upcoming trip to the friend's house.
- C) The speaker is too fatigued to continue a discussion with the friend.
- D) The speaker is thinking about the friend instead of immediately falling asleep.



Black beans (*Phaseolus vulgaris*) are a nutritionally dense food, but they are difficult to digest in part because of their high levels of soluble fiber and compounds like raffinose. They also contain antinutrients like tannins and trypsin inhibitors, which interfere with the body's ability to extract nutrients from foods. In a research article, Marisela Granito and Glenda Álvarez from Simón Bolívar University in Venezuela claim that inducing fermentation of black beans using lactic acid bacteria improves the digestibility of the beans and makes them more nutritious.

Which finding from Granito and Álvarez's research, if true, would most directly support their claim?

- A) When cooked, fermented beans contained significantly more trypsin inhibitors and tannins but significantly less soluble fiber and raffinose than nonfermented beans.
- B) Fermented beans contained significantly less soluble fiber and raffinose than nonfermented beans, and when cooked, the fermented beans also displayed a significant reduction in trypsin inhibitors and tannins.
- C) When the fermented beans were analyzed, they were found to contain two microorganisms, *Lactobacillus casei* and *Lactobacillus plantarum*, that are theorized to increase the amount of nitrogen absorbed by the gut after eating beans.
- D) Both fermented and nonfermented black beans contained significantly fewer trypsin inhibitors and tannins after being cooked at high pressure.

Ablation Rates for Three Elements in  
Cosmic Dust, by Dust Source

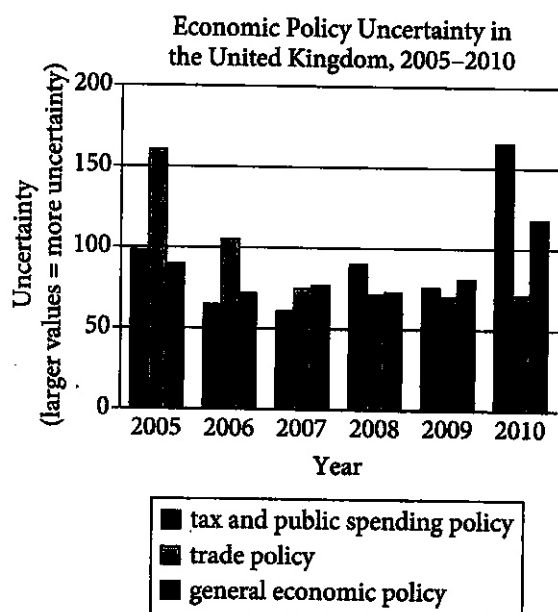
Element	SPC	AST	HTC	OCC
iron	20%	28%	90%	98%
potassium	44%	74%	97%	100%
sodium	45%	75%	99%	100%

Earth's atmosphere is bombarded by cosmic dust originating from several sources: short-period comets (SPCs), particles from the asteroid belt (ASTs), Halley-type comets (HTCs), and Oort cloud comets (OCCs). Some of the dust's material vaporizes in the atmosphere in a process called ablation, and the faster the particles move, the higher the rate of ablation. Astrophysicist Juan Diego Carrillo-Sánchez led a team that calculated average ablation rates for elements in the dust (such as iron and potassium) and showed that material in slower-moving SPC or AST dust has a lower rate than the same material in faster-moving HTC or OCC dust. For example, whereas the average ablation rate for iron from AST dust is 28%, the average rate for \_\_\_\_\_

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

- A) iron from SPC dust is 20%.
- B) sodium from OCC dust is 100%.
- C) iron from HTC dust is 90%.
- D) sodium from AST dust is 75%.

11



High levels of public uncertainty about which economic policies a country will adopt can make planning difficult for businesses, but measures of such uncertainty have not tended to be very detailed. Recently, however, economist Sandile Hlatshwayo analyzed trends in news reports to derive measures not only for general economic policy uncertainty but also for uncertainty related to specific areas of economic policy, like tax or trade policy. One revelation of her work is that a general measure may not fully reflect uncertainty about specific areas of policy, as in the case of the United Kingdom, where general economic policy uncertainty \_\_\_\_\_

Which choice most effectively uses data from the graph to illustrate the claim?

- A) aligned closely with uncertainty about tax and public spending policy in 2005 but differed from uncertainty about tax and public spending policy by a large amount in 2009.
- B) was substantially lower than uncertainty about tax and public spending policy each year from 2005 to 2010.
- C) reached its highest level between 2005 and 2010 in the same year that uncertainty about trade policy and tax and public spending policy reached their lowest levels.
- D) was substantially lower than uncertainty about trade policy in 2005 and substantially higher than uncertainty about trade policy in 2010.

12

**Average Number and Duration of Torpor Bouts and Arousal Episodes for Alaska Marmots and Arctic Ground Squirrels, 2008–2011**

Feature	Alaska marmots	Arctic ground squirrels
torpor bouts	12	10.5
duration per bout	13.81 days	16.77 days
arousal episodes	11	9.5
duration per episode	21.2 hours	14.2 hours

When hibernating, Alaska marmots and Arctic ground squirrels enter a state called torpor, which minimizes the energy their bodies need to function. Often a hibernating animal will temporarily come out of torpor (called an arousal episode) and its metabolic rate will rise, burning more of the precious energy the animal needs to survive the winter. Alaska marmots hibernate in groups and therefore burn less energy keeping warm during these episodes than they would if they were alone. A researcher hypothesized that because Arctic ground squirrels hibernate alone, they would likely exhibit longer bouts of torpor and shorter arousal episodes than Alaska marmots.

Which choice best describes data from the table that support the researcher's hypothesis?

- A) The Alaska marmots' arousal episodes lasted for days, while the Arctic ground squirrels' arousal episodes lasted less than a day.
- B) The Alaska marmots and the Arctic ground squirrels both maintained torpor for several consecutive days per bout, on average.
- C) The Alaska marmots had shorter torpor bouts and longer arousal episodes than the Arctic ground squirrels did.
- D) The Alaska marmots had more torpor bouts than arousal episodes, but their arousal episodes were much shorter than their torpor bouts.

Employment by Sector in France and the United States, 1800–2012  
(% of total employment)

Year	Agriculture in France	Manufacturing in France	Services in France	Agriculture in US	Manufacturing in US	Services in US
1800	64	22	14	68	18	13
1900	43	29	28	41	28	31
1950	32	33	35	14	33	53
2012	3	21	76	2	18	80

Rows in table may not add up to 100 due to rounding.

Over the past two hundred years, the percentage of the population employed in the agricultural sector has declined in both France and the United States, while employment in the service sector (which includes jobs in retail, consulting, real estate, etc.) has risen. However, this transition happened at very different rates in the two countries. This can be seen most clearly by comparing the employment by sector in both countries in \_\_\_\_\_.

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

- A) 1900 with the employment by sector in 1950.
- B) 1800 with the employment by sector in 2012.
- C) 1900 with the employment by sector in 2012.
- D) 1800 with the employment by sector in 1900.

*Euphorbia esula* (leafy spurge) is a Eurasian plant that has become invasive in North America, where it displaces native vegetation and sickens cattle.

*E. esula* can be controlled with chemical herbicides, but that approach can also kill harmless plants nearby. Recent research on introducing engineered DNA into plant species to inhibit their reproduction may offer a path toward exclusively targeting *E. esula*, consequently \_\_\_\_\_

Which choice most logically completes the text?

- A) making individual *E. esula* plants more susceptible to existing chemical herbicides.
- B) enhancing the ecological benefits of *E. esula* in North America.
- C) enabling cattle to consume *E. esula* without becoming sick.
- D) reducing invasive *E. esula* numbers without harming other organisms.

Both Sona Charaipotra, an Indian American, and Dhonielle Clayton, an African American, grew up frustrated by the lack of diverse characters in books for young people. In 2011, these two writers joined forces to found CAKE Literary, a book packaging \_\_\_\_\_ specializes in the creation and promotion of stories told from diverse perspectives for children and young adults.

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

- A) company,
- B) company that
- C) company
- D) company, that

In 1930, Japanese American artist Chiura Obata depicted the natural beauty of Yosemite National Park in two memorable woodcuts: *Evening at Carl Inn* and *Lake Basin in the High Sierra*. In 2019, \_\_\_\_\_ exhibited alongside 150 of Obata's other works in a single-artist show at the Smithsonian American Art Museum.

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

- A) it was
- B) they were
- C) this was
- D) some were

American writer Edwidge Danticat, who emigrated from Haiti in 1981, has won acclaim for her powerful short stories, novels, and \_\_\_\_\_ her lyrical yet unflinching depictions of her native country's turbulent history, writer Robert Antoni has compared Danticat to Nobel Prize-winning novelist Toni Morrison.

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

- A) essays, praising
- B) essays and praising
- C) essays praising
- D) essays. Praising

In 1966, Emmett Ashford became the first African American to umpire a Major League Baseball game. His energetic gestures announcing when a player had struck out and his habit of barreling after a hit ball to see if it would land out of \_\_\_\_\_ transform the traditionally solemn umpire role into a dynamic one.

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

- A) bounds helped
- B) bounds, helping
- C) bounds that helped
- D) bounds to help

In crafting her fantasy fiction, Nigerian-born British author Helen Oyeyemi has drawn inspiration from the classic nineteenth-century fairy tales of the Brothers Grimm. Her 2014 novel *Boy, Snow, Bird*, for instance, is a complex retelling of the story of Snow White, while her 2019 novel \_\_\_\_\_ offers a delicious twist on the classic tale of Hansel and Gretel.

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

- A) *Gingerbread*—
- B) *Gingerbread*,
- C) *Gingerbread*
- D) *Gingerbread*:

The violins handmade in the seventeenth century by Italian craftsman Antonio Stradivari have been celebrated as some of the finest in the world. In close collaboration with musicians, Stradivari introduced changes to the shape of a traditional violin, flattening some of the instrument's curves and making \_\_\_\_\_ lighter overall.

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

- A) those
- B) one
- C) them
- D) it

During the English neoclassical period (1660–1789), many writers imitated the epic poetry and satires of ancient Greece and Rome. They were not the first in England to adopt the literary modes of classical \_\_\_\_\_ some of the most prominent figures of the earlier Renaissance period were also influenced by ancient Greek and Roman literature.

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

- A) antiquity, however
- B) antiquity, however,
- C) antiquity, however;
- D) antiquity; however,

32

One poll taken after the first 1960 presidential debate suggested that John Kennedy lost badly: only 21 percent of those who listened on the radio rated him the winner. \_\_\_\_\_ the debate was ultimately considered a victory for the telegenic young senator, who rated higher than his opponent, Vice President Richard Nixon, among those watching on the new medium of television.

Which choice completes the text with the most logical transition?

- A) In other words,
- B) Therefore,
- C) Likewise,
- D) Nevertheless,

33

In November 1934, Amrita Sher-Gil was living in what must have seemed like the ideal city for a young artist: Paris. She was studying firsthand the color-saturated style of France's modernist masters and beginning to make a name for herself as a painter. \_\_\_\_\_ Sher-Gil longed to return to her childhood home of India; only there, she believed, could her art truly flourish.

Which choice completes the text with the most logical transition?

- A) Still,
- B) Therefore,
- C) Indeed,
- D) Furthermore,

24

In his 1925 book *The Morphology of Landscape*, US geographer Carl Sauer challenged prevailing views about how natural landscapes influence human cultures. \_\_\_\_\_ Sauer argued that instead of being shaped entirely by their natural surroundings, cultures play an active role in their own development by virtue of their interactions with the environment.

Which choice completes the text with the most logical transition?

- A) Similarly,
- B) Finally,
- C) Therefore,
- D) Specifically,

25

Although those who migrated to California in 1849 dreamed of finding gold nuggets in streambeds, the state's richest deposits were buried deeply in rock, beyond the reach of individual prospectors. \_\_\_\_\_ by 1852, many had given up their fortune-hunting dreams and gone to work for one of the large companies capable of managing California's complex mining operations.

Which choice completes the text with the most logical transition?

- A) Furthermore,
- B) Still,
- C) Consequently,
- D) Next,

26

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

- In 2013, archaeologists studied cat bone fragments they had found in the ruins of Quanhucun, a Chinese farming village.
- The fragments were estimated to be 5,300 years old.
- A chemical analysis of the fragments revealed that the cats had consumed large amounts of grain.
- The grain consumption is evidence that the Quanhucun cats may have been domesticated.

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

- A) As part of a 2013 study of cat domestication, a chemical analysis was conducted on cat bone fragments found in Quanhucun, China.
- B) A 2013 analysis of cat bone fragments found in Quanhucun, China, suggests that cats there may have been domesticated 5,300 years ago.
- C) In 2013, archaeologists studied what cats in Quanhucun, China, had eaten more than 5,000 years ago.
- D) Cat bone fragments estimated to be 5,300 years old were found in Quanhucun, China, in 2013.

27

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

- Started in 1925, the Scripps National Spelling Bee is a US-based spelling competition.
- The words used in the competition have diverse linguistic origins.
- In 2008, Sameer Mishra won by correctly spelling the word “guerdon.”
- “Guerdon” derives from the Anglo-French word “guerdun.”
- In 2009, Kavya Shivashankar won by correctly spelling the word “Laodicean.”
- “Laodicean” derives from the ancient Greek word “Laodíkeia.”

The student wants to emphasize a difference in the origins of the two words. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- A) “Guerdon,” the final word of the 2008 Scripps National Spelling Bee, is of Anglo-French origin, while the following year’s final word, “Laodicean,” derives from ancient Greek.
- B) In 2008, Sameer Mishra won the Scripps National Spelling Bee by correctly spelling the word “guerdon”; however, the following year, Kavya Shivashankar won based on spelling the word “Laodicean.”
- C) Kavya Shivashankar won the 2009 Scripps National Spelling Bee by correctly spelling “Laodicean,” which derives from the ancient Greek word “Laodíkeia.”
- D) The Scripps National Spelling Bee uses words from diverse linguistic origins, such as “guerdon” and “Laodicean.”

**STOP**

**If you finish before time is called, you may check your work on this module only.  
Do not turn to any other module in the test.**

# Reading and Writing

## 27 QUESTIONS

### DIRECTIONS

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Due to their often strange images, highly experimental syntax, and opaque subject matter, many of John Ashbery's poems can be quite difficult to \_\_\_\_\_ and thus are the object of heated debate among scholars.

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

- A) delegate
- B) compose
- C) interpret
- D) renounce

Mônica Lopes-Ferreira and others at Brazil's Butantan Institute are studying the freshwater stingray species *Potamotrygon rex* to determine whether biological characteristics such as the rays' age and sex have \_\_\_\_\_ effect on the toxicity of their venom—that is, to see if differences in these traits are associated with considerable variations in venom potency.

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

- A) a disconcerting
- B) an acceptable
- C) an imperceptible
- D) a substantial

Former astronaut Ellen Ochoa says that although she doesn't have a definite idea of when it might happen, she \_\_\_\_\_ that humans will someday need to be able to live in other environments than those found on Earth. This conjecture informs her interest in future research missions to the moon.

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

- A) demands
- B) speculates
- C) doubts
- D) establishes

Following the principles of community-based participatory research, tribal nations and research institutions are equal partners in health studies conducted on reservations. A collaboration between the Crow Tribe and Montana State University \_\_\_\_\_ this model: tribal citizens worked alongside scientists to design the methodology and continue to assist in data collection.

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

- A) circumvents
- B) eclipses
- C) fabricates
- D) exemplifies



5

Researchers have struggled to pinpoint specific causes for hiccups, which happen when a person's diaphragm contracts \_\_\_\_\_. However, neuroscientist Kimberley Whitehead has found that these uncontrollable contractions may play an important role in helping infants regulate their breathing.

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

- A) involuntarily
- B) beneficially
- C) strenuously
- D) smoothly

6

The parasitic dodder plant increases its reproductive success by flowering at the same time as the host plant it has latched onto. In 2020, Jianqiang Wu and his colleagues determined that the tiny dodder achieves this \_\_\_\_\_ with its host by absorbing and utilizing a protein the host produces when it is about to flower.

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

- A) synchronization
- B) hibernation
- C) prediction
- D) moderation

7

Ofelia Zepeda's contributions to the field of linguistics are \_\_\_\_\_. her many accomplishments include working as a linguistics professor and bilingual poet, authoring the first Tohono O'odham grammar book, and co-founding the American Indian Language Development Institute.

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

- A) pragmatic
- B) controversial
- C) extensive
- D) universal

8

In the Indigenous intercropping system known as the Three Sisters, maize, squash, and beans form an \_\_\_\_\_ web of relations: maize provides the structure on which the bean vines grow; the squash vines cover the soil, discouraging competition from weeds; and the beans aid their two "sisters" by enriching the soil with essential nitrogen.

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

- A) indecipherable
- B) ornamental
- C) obscure
- D) intricate

The following text is adapted from Oscar Wilde's 1891 novel *The Picture of Dorian Gray*. Dorian Gray is taking his first look at a portrait that Hallward has painted of him.

Dorian passed listlessly in front of his picture and turned towards it. When he saw it he drew back, and his cheeks flushed for a moment with pleasure. A look of joy came into his eyes, as if he had recognized himself for the first time. He stood there motionless and in wonder, dimly conscious that Hallward was speaking to him, but not catching the meaning of his words. The sense of his own beauty came on him like a revelation. He had never felt it before.

According to the text, what is true about Dorian?

- A) He wants to know Hallward's opinion of the portrait.
- B) He is delighted by what he sees in the portrait.
- C) He prefers portraits to other types of paintings.
- D) He is uncertain of Hallward's talent as an artist.

"Often Rebuked, Yet Always Back Returning" is an 1846 poem by Emily Brontë. The poem conveys the speaker's determination to experience the countryside around her: \_\_\_\_\_

Which quotation from the poem most effectively illustrates the claim?

- A) "Often rebuked, yet always back returning / To those first feelings that were born with me, / And leaving busy chase of wealth and learning / For idle dreams of things which cannot be."
- B) "I'll walk, but not in old heroic traces, / And not in paths of high morality, / And not among the half-distinguished faces, / The clouded forms of long-past history."
- C) "I'll walk where my own nature would be leading: / It vexes me to choose another guide: / Where the grey flocks in ferny glens are feeding; / Where the wild wind blows on the mountain side."
- D) "To-day, I will seek not the shadowy region; / Its unsustaining vastness waxes drear; / And visions rising, legion after legion, / Bring the unreal world too strangely near."

"Mrs. Spring Fragrance" is a 1912 short story by Sui Sin Far. In the story, Mrs. Spring Fragrance, a Chinese immigrant living in Seattle, is traveling in California. In letters to her husband and friend, she demonstrates her concern for what's happening at her home in Seattle while she is away: \_\_\_\_\_

Which quotation from Mrs. Spring Fragrance's letters most effectively illustrates the claim?

- A) "My honorable cousin is preparing for the Fifth Moon Festival, and wishes me to compound for the occasion some American 'fudge' for which delectable sweet, made by my clumsy hands, you have sometimes shown a slight prejudice."
- B) "Next week I accompany Ah Oi to the beautiful town of San José. There will we be met by the son of the Illustrious Teacher."
- C) "Forget not to care for the cat, the birds, and the flowers. Do not eat too quickly nor fan too vigorously now that the weather is warming."
- D) "I am enjoying a most agreeable visit, and American friends, as also our own, strive benevolently for the accomplishment of my pleasure."

*Hedda Gabler* is an 1890 play by Henrik Ibsen. As a woman in the Victorian era, Hedda, the play's central character, is unable to freely determine her own future. Instead, she seeks to influence another person's fate, as is evident when she says to another character, \_\_\_\_\_

Which quotation from a translation of *Hedda Gabler* most effectively illustrates the claim?

- A) "Then what in heaven's name would you have me do with myself?"
- B) "I want for once in my life to have power to mould a human destiny."
- C) "Then I, poor creature, have no sort of power over you?"
- D) "Faithful to your principles, now and for ever! Ah, that is how a man should be!"

If some artifacts recovered from excavations of the settlement of Kuulo Kataa, in modern Ghana, date from the thirteenth century CE, that may lend credence to claims that the settlement was founded before or around that time. There is other evidence, however, strongly supporting a fourteenth century CE founding date for Kuulo Kataa. If both the artifact dates and the fourteenth century CE founding date are correct, that would imply that \_\_\_\_\_

Which choice most logically completes the text?

- A) artifacts from the fourteenth century CE are more commonly recovered than are artifacts from the thirteenth century CE.
- B) the artifacts originated elsewhere and eventually reached Kuulo Kataa through trade or migration.
- C) Kuulo Kataa was founded by people from a different region than had previously been assumed.
- D) excavations at Kuulo Kataa may have inadvertently damaged some artifacts dating to the fourteenth century CE.

14

One theory behind human bipedalism speculates that it originated in a mostly ground-based ancestor that practiced four-legged "knuckle-walking," like chimpanzees and gorillas do today, and eventually evolved into moving upright on two legs. But recently, researchers observed orangutans, another relative of humans, standing on two legs on tree branches and using their arms for balance while they reached for fruits. These observations may suggest that \_\_\_\_\_

Which choice most logically completes the text?

- A) bipedalism evolved because it was advantageous to a tree-dwelling ancestor of humans.
- B) bipedalism must have evolved simultaneously with knuckle-walking and tree-climbing.
- C) moving between the ground and the trees would have been difficult without bipedalism.
- D) a knuckle-walking human ancestor could have easily moved bipedally in trees.

15

In a study of the cognitive abilities of white-faced capuchin monkeys (*Cebus imitator*), researchers neglected to control for the physical difficulty of the tasks they used to evaluate the monkeys. The cognitive abilities of monkeys given problems requiring little dexterity, such as sliding a panel to retrieve food, were judged by the same criteria as were those of monkeys given physically demanding problems, such as unscrewing a bottle and inserting a straw. The results of the study, therefore, \_\_\_\_\_

Which choice most logically completes the text?

- A) could suggest that there are differences in cognitive ability among the monkeys even though such differences may not actually exist.
- B) are useful for identifying tasks that the monkeys lack the cognitive capacity to perform but not for identifying tasks that the monkeys can perform.
- C) should not be taken as indicative of the cognitive abilities of any monkey species other than *C. imitator*.
- D) reveal more about the monkeys' cognitive abilities when solving artificial problems than when solving problems encountered in the wild.

16

The increased integration of digital technologies throughout the process of book creation in the late 20th and early 21st centuries lowered the costs of book production, but those decreased costs have been most significant in the manufacturing and distribution process, which occurs after the authoring, editing, and design of the book are complete. This suggests that in the late 20th and early 21st centuries, \_\_\_\_\_

Which choice most logically completes the text?

- A) digital technologies made it easier than it had been previously for authors to write very long works and get them published.
- B) customers generally expected the cost of books to decline relative to the cost of other consumer goods.
- C) publishers increased the variety of their offerings by printing more unique titles but also printed fewer copies of each title.
- D) the costs of writing, editing, and designing a book were less affected by the technologies used than were the costs of manufacturing and distributing a book.

17

Public-awareness campaigns about the need to reduce single-use plastics can be successful, says researcher Kim Borg of Monash University in Australia, when these campaigns give consumers a choice: for example, Japan achieved a 40 percent reduction in plastic-bag use after cashiers were instructed to ask customers whether \_\_\_\_\_ wanted a bag.

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

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

18

A member of the Cherokee Nation, Mary Golda Ross is renowned for her contributions to NASA's Planetary Flight Handbook, which \_\_\_\_\_ detailed mathematical guidance for missions to Mars and Venus.

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

- A) provided
- B) having provided
- C) to provide
- D) providing

19

Typically, underlines, scribbles, and notes left in the margins by a former owner lower a book's \_\_\_\_\_ when the former owner is a famous poet like Walt Whitman, such markings, known as marginalia, can be a gold mine to literary scholars.

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

- A) value, but
- B) value
- C) value,
- D) value but

20

British scientists James Watson and Francis Crick won the Nobel Prize in part for their 1953 paper announcing the double helix structure of DNA, but it is misleading to say that Watson and Crick discovered the double helix. \_\_\_\_\_ findings were based on a famous X-ray image of DNA fibers, "Photo 51," developed by X-ray crystallographer Rosalind Franklin and her graduate student Raymond Gosling.

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

- A) They're
- B) It's
- C) Their
- D) Its

In order to prevent nonnative fish species from moving freely between the Mediterranean and Red Seas, marine biologist Bella Galil has proposed that a saline lock system be installed along the Suez Canal in Egypt's Great Bitter Lakes. The lock would increase the salinity of the lakes and \_\_\_\_\_ a natural barrier of water most marine creatures would be unable to cross.

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

- A) creates
- B) create
- C) creating
- D) created

Lucía Michel of the University of Chile observed that alkaline soils contain an insoluble form of iron that blueberry plants cannot absorb, thus inhibiting blueberry growth. If these plants were grown in alkaline soil alongside grasses that aid in iron solubilization, \_\_\_\_\_ Michel was determined to find out.

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

- A) could the blueberries thrive.
- B) the blueberries could thrive.
- C) the blueberries could thrive?
- D) could the blueberries thrive?

The classic children's board game Chutes and Ladders is a version of an ancient Nepalese game, Paramapada Sopanapata. In both games, players encounter "good" or "bad" spaces while traveling along a path; landing on one of the good spaces \_\_\_\_\_ a player to skip ahead and arrive closer to the end goal.

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

- A) allows
- B) are allowing
- C) have allowed
- D) allow

In 1968, US Congressman John Conyers introduced a bill to establish a national holiday in honor of Dr. Martin Luther King Jr. The bill didn't make it to a vote, but Conyers was determined. He teamed up with Shirley Chisholm, the first Black woman to be elected to Congress, and they resubmitted the bill every session for the next fifteen years. \_\_\_\_\_ in 1983, the bill passed.

Which choice completes the text with the most logical transition?

- A) Instead,
- B) Likewise,
- C) Finally,
- D) Additionally,

25

Most conifers (trees belonging to the phylum Coniferophyta) are evergreen. That is, they keep their green leaves or needles year-round. However, not all conifer species are evergreen. Larch trees, \_\_\_\_\_ lose their needles every fall.

Which choice completes the text with the most logical transition?

- A) for instance,
- B) nevertheless,
- C) meanwhile,
- D) in addition,

26

Samuel Coleridge-Taylor was a prominent classical music composer from England who toured the US three times in the early 1900s. The child of a West African father and an English mother, Coleridge-Taylor emphasized his mixed-race ancestry. For example, he referred to himself as Anglo-African. \_\_\_\_\_ he incorporated the sounds of traditional African music into his classical music compositions.

Which choice completes the text with the most logical transition?

- A) In addition,
- B) Actually,
- C) However,
- D) Regardless,

27

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

- British musicians John Lennon and Paul McCartney shared writing credit for numerous Beatles songs.
- Many Lennon-McCartney songs were actually written by either Lennon or McCartney, not by both.
- The exact authorship of specific parts of many Beatles songs, such as the verse for "In My Life," is disputed.
- Mark Glickman, Jason Brown, and Ryan Song used statistical methods to analyze the musical content of Beatles songs.
- They concluded that there is 18.9% probability that McCartney wrote the verse for "In My Life," stating that the verse is "consistent with Lennon's songwriting style."

The student wants to make a generalization about the kind of study conducted by Glickman, Brown, and Song. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- A) Based on statistical analysis, Glickman, Brown, and Song claim that John Lennon wrote the verse of "In My Life."
- B) There is only an 18.9% probability that Paul McCartney wrote the verse for "In My Life"; John Lennon is the more likely author.
- C) It is likely that John Lennon, not Paul McCartney, wrote the verse for "In My Life."
- D) Researchers have used statistical methods to address questions of authorship within the field of music.

**STOP**

**If you finish before time is called, you may check your work on this module only.  
Do not turn to any other module in the test.**

**Test begins on the next page.**

## Math

## 22 QUESTIONS

## DIRECTIONS

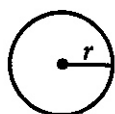
The questions in this section address a number of important math skills. Use of a calculator is permitted for all questions.

## NOTES

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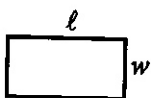
- All variables and expressions represent real numbers.
- Figures provided are drawn to scale.
- All figures lie in a plane.
- The domain of a given function  $f$  is the set of all real numbers  $x$  for which  $f(x)$  is a real number.

## REFERENCE

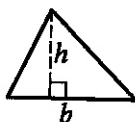


$$A = \pi r^2$$

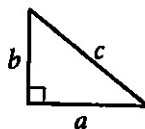
$$C = 2\pi r$$



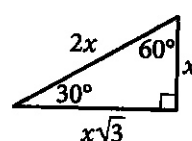
$$A = \ell w$$



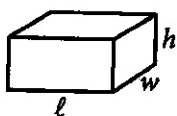
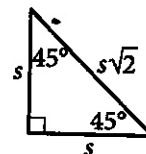
$$A = \frac{1}{2}bh$$



$$c^2 = a^2 + b^2$$



Special Right Triangles



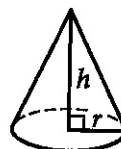
$$V = \ell wh$$



$$V = \pi r^2 h$$



$$V = \frac{4}{3}\pi r^3$$



$$V = \frac{1}{3}\pi r^2 h$$



$$V = \frac{1}{3}\ell wh$$

The number of degrees of arc in a circle is 360.

The number of radians of arc in a circle is  $2\pi$ .

The sum of the measures in degrees of the angles of a triangle is 180.



**For multiple-choice questions,** solve each problem, choose the correct answer from the choices provided, and then circle your answer in this book. Circle only one answer for each question. If you change your mind, completely erase the circle. You will not get credit for questions with more than one answer circled, or for questions with no answers circled.

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- Don't include **symbols** such as a percent sign, comma, or dollar sign in your circled answer.

4, 4, 4, 4, 8, 8, 8, 13, 13

Which frequency table correctly represents the data listed?

A)

Number	Frequency
4	4
8	3
13	2

B)

Number	Frequency
4	4
3	8
2	13

C)

Number	Frequency
4	16
8	24
13	26

D)

Number	Frequency
16	4
24	8
26	13

Which expression is equivalent to  $x^2 + 3x - 40$ ?

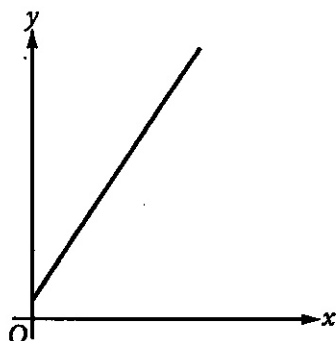
- A)  $(x - 4)(x + 10)$   
B)  $(x - 5)(x + 8)$   
C)  $(x - 8)(x + 5)$   
D)  $(x - 10)(x + 4)$

Jay walks at a speed of 3 miles per hour and runs at a speed of 5 miles per hour. He walks for  $w$  hours and runs for  $r$  hours for a combined total of 14 miles. Which equation represents this situation?

- A)  $3w + 5r = 14$   
B)  $\frac{1}{3}w + \frac{1}{5}r = 14$   
C)  $\frac{1}{3}w + \frac{1}{5}r = 112$   
D)  $3w + 5r = 112$

In triangle  $ABC$ , the measure of angle  $B$  is  $52^\circ$  and the measure of angle  $C$  is  $17^\circ$ . What is the measure of angle  $A$ ?

- A)  $21^\circ$   
B)  $35^\circ$   
C)  $69^\circ$   
D)  $111^\circ$



The graph represents the total charge, in dollars, by an electrician for  $x$  hours of work. The electrician charges a onetime fee plus an hourly rate. What is the best interpretation of the slope of the graph?

- A) The electrician's hourly rate
- B) The electrician's onetime fee
- C) The maximum amount that the electrician charges
- D) The total amount that the electrician charges

The table summarizes the distribution of color and shape for 100 tiles of equal area.

	Red	Blue	Yellow	Total
Square	10	20	25	55
Pentagon	20	10	15	45
Total	30	30	40	100

If one of these tiles is selected at random, what is the probability of selecting a red tile? (Express your answer as a decimal or fraction, not as a percent.)

From a population of 50,000 people, 1,000 were chosen at random and surveyed about a proposed piece of legislation. Based on the survey, it is estimated that 35% of people in the population support the legislation, with an associated margin of error of 3%. Based on these results, which of the following is a plausible value for the total number of people in the population who support the proposed legislation?

- A) 350
- B) 650
- C) 16,750
- D) 31,750

$$\frac{55}{x+6} = x$$

What is the positive solution to the given equation?

An airplane descends from an altitude of 9,500 feet to 5,000 feet at a constant rate of 400 feet per minute. What type of function best models the relationship between the descending airplane's altitude and time?

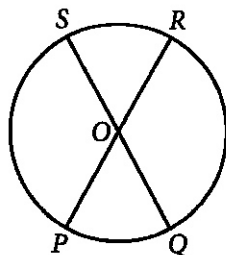
- A) Decreasing exponential
- B) Decreasing linear
- C) Increasing exponential
- D) Increasing linear

$$g(x) = 11\left(\frac{1}{12}\right)^x$$

If the given function  $g$  is graphed in the  $xy$ -plane, where  $y = g(x)$ , what is the  $y$ -intercept of the graph?

- A) (0, 11)
- B) (0, 132)
- C) (0, 1)
- D) (0, 12)

11



Note: Figure not drawn to scale.

The circle shown has center  $O$ , circumference  $144\pi$ , and diameters  $PR$  and  $QS$ . The length of arc  $PS$  is twice the length of arc  $PQ$ . What is the length of arc  $QR$ ?

- A)  $24\pi$
- B)  $48\pi$
- C)  $72\pi$
- D)  $96\pi$

12

A rectangle has a length of  $x$  units and a width of  $(x - 15)$  units. If the rectangle has an area of 76 square units, what is the value of  $x$ ?

- A) 4
- B) 19
- C) 23
- D) 76

13

Time (years)	Total amount (dollars)
0	604.00
1	606.42
2	608.84

Rosa opened a savings account at a bank. The table shows the exponential relationship between the time  $t$ , in years, since Rosa opened the account and the total amount  $n$ , in dollars, in the account. If Rosa made no additional deposits or withdrawals, which of the following equations best represents the relationship between  $t$  and  $n$ ?

- A)  $n = (1 + 604)^t$
- B)  $n = (1 + 0.004)^t$
- C)  $n = 604(1 + 0.004)^t$
- D)  $n = 0.004(1 + 604)^t$

14

At how many points do the graphs of the equations  $y = x + 20$  and  $y = 8x$  intersect in the  $xy$ -plane?

- A) 0
- B) 1
- C) 2
- D) 8

15

$$5G + 45R = 380$$

At a school fair, students can win colored tokens that are worth a different number of points depending on the color. One student won  $G$  green tokens and  $R$  red tokens worth a total of 380 points. The given equation represents this situation. How many more points is a red token worth than a green token?

16

The number of bacteria in a liquid medium doubles every day. There are 44,000 bacteria in the liquid medium at the start of an observation. Which represents the number of bacteria,  $y$ , in the liquid medium  $t$  days after the start of the observation?

- A)  $y = \frac{1}{2}(44,000)^t$
- B)  $y = 2(44,000)^t$
- C)  $y = 44,000\left(\frac{1}{2}\right)^t$
- D)  $y = 44,000(2)^t$

17

A cylinder has a diameter of 8 inches and a height of 12 inches. What is the volume, in cubic inches, of the cylinder?

- A)  $16\pi$
- B)  $96\pi$
- C)  $192\pi$
- D)  $768\pi$

18

$$\begin{aligned} 6x + 7y &= 28 \\ 2x + 2y &= 10 \end{aligned}$$

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

- A) -2
- B) 7
- C) 14
- D) 18

19

In triangle  $JKL$ ,  $\cos(K) = \frac{24}{51}$  and angle  $J$  is a right angle. What is the value of  $\cos(L)$ ?

20

$$f(x) = 4x^2 - 50x + 126$$

The given equation defines the function  $f$ . For what value of  $x$  does  $f(x)$  reach its minimum?

21

In the  $xy$ -plane, line  $\ell$  passes through the point  $(0, 0)$  and is parallel to the line represented by the equation  $y = 8x + 2$ . If line  $\ell$  also passes through the point  $(3, d)$ , what is the value of  $d$ ?

22

In the  $xy$ -plane, a line with equation  $2y = c$  for some constant  $c$  intersects a parabola at exactly one point. If the parabola has equation  $y = -2x^2 + 9x$ , what is the value of  $c$ ?

# STOP

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# Math

## 22 QUESTIONS

### DIRECTIONS

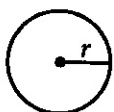
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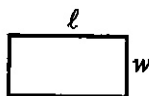
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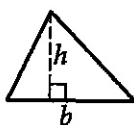


$$A = \pi r^2$$

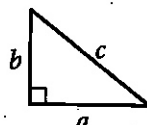
$$C = 2\pi r$$



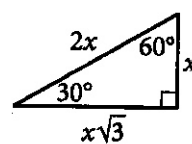
$$A = \ell w$$



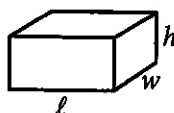
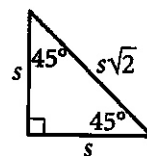
$$A = \frac{1}{2}bh$$



$$c^2 = a^2 + b^2$$



Special Right Triangles



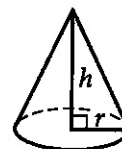
$$V = \ell wh$$



$$V = \pi r^2 h$$



$$V = \frac{4}{3}\pi r^3$$



$$V = \frac{1}{3}\pi r^2 h$$



$$V = \frac{1}{3}\ell wh$$

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The number of radians of arc in a circle is  $2\pi$ .

The sum of the measures in degrees of the angles of a triangle is 180.

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- Don't include **symbols** such as a percent sign, comma, or dollar sign in your circled answer.

1

71, 72, 73, 76, 77, 79, 83, 87, 93

What is the median of the data shown?

- A) 71
- B) 77
- C) 78
- D) 79

5

The number  $y$  is 84 less than the number  $x$ . Which equation represents the relationship between  $x$  and  $y$ ?

- A)  $y = x + 84$
- B)  $y = \frac{1}{84}x$
- C)  $y = 84x$
- D)  $y = x - 84$

6

The expression  $\frac{24}{6x + 42}$  is equivalent to  $\frac{4}{x + b}$ , where  $b$  is a constant and  $x > 0$ . What is the value of  $b$ ?

- A) 7
- B) 10
- C) 24
- D) 252

7

Out of 300 seeds that were planted, 80% sprouted. How many of these seeds sprouted?

2

$$x + 40 = 95$$

What value of  $x$  is the solution to the given equation?

3

What is the area of a rectangle with a length of 17 centimeters (cm) and a width of 7 cm?

- A)  $24 \text{ cm}^2$
- B)  $48 \text{ cm}^2$
- C)  $119 \text{ cm}^2$
- D)  $576 \text{ cm}^2$

4

Which expression is equivalent to  $20w - (4w + 3w)$ ?

- A)  $10w$
- B)  $13w$
- C)  $19w$
- D)  $21w$



8

Ty set a goal to walk at least 24 kilometers every day to prepare for a multiday hike. On a certain day, Ty plans to walk at an average speed of 4 kilometers per hour. What is the minimum number of hours Ty must walk on that day to fulfill the daily goal?

- A) 4
- B) 6
- C) 20
- D) 24

9

If  $6 + x = 9$ , what is the value of  $18 + 3x$ ?

10

The function  $f$  is defined by  $f(x) = x^3 + 9$ . What is the value of  $f(2)$ ?

- A) 14
- B) 15
- C) 17
- D) 18

11

The total cost  $f(x)$ , in dollars, to lease a car for 36 months from a particular car dealership is given by  $f(x) = 36x + 1,000$ , where  $x$  is the monthly payment, in dollars. What is the total cost to lease a car when the monthly payment is \$400?

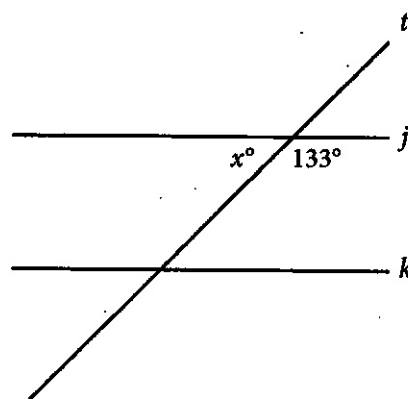
- A) \$13,400
- B) \$13,000
- C) \$15,400
- D) \$37,400

12

The function  $g$  is defined by  $g(x) = 10x + 8$ . What is the value of  $g(x)$  when  $x = 8$ ?

- A) 0
- B) 8
- C) 10
- D) 88

13



Note: Figure not drawn to scale.

In the figure, line  $j$  is parallel to line  $k$ . What is the value of  $x$ ?

14

The graph of  $7x + 2y = -31$  in the  $xy$ -plane has an  $x$ -intercept at  $(a, 0)$  and a  $y$ -intercept at  $(0, b)$ , where  $a$  and  $b$  are constants. What is the value of  $\frac{b}{a}$ ?

- A)  $-\frac{7}{2}$
- B)  $-\frac{2}{7}$
- C)  $\frac{2}{7}$
- D)  $\frac{7}{2}$

13

An object travels at a constant speed of 12 centimeters per second. At this speed, what is the time, in seconds, that it would take for the object to travel 108 centimeters?

- A) 9
- B) 96
- C) 120
- D) 972

16

John paid a total of \$165 for a microscope by making a down payment of \$37 plus  $p$  monthly payments of \$16 each. Which of the following equations represents this situation?

- A)  $16p - 37 = 165$
- B)  $37p - 16 = 165$
- C)  $16p + 37 = 165$
- D)  $37p + 16 = 165$

17

$x$	$y$
0	18
1	13
2	8

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

- A)  $y = 18x + 13$
- B)  $y = 18x + 18$
- C)  $y = -5x + 13$
- D)  $y = -5x + 18$

18

An object is kicked from a platform. The equation  $h = -4.9t^2 + 7t + 9$  represents this situation, where  $h$  is the height of the object above the ground, in meters,  $t$  seconds after it is kicked. Which number represents the height, in meters, from which the object was kicked?

- A) 0
- B) 4.9
- C) 7
- D) 9

19

$$h(x) = x^2 - 3$$

Which table gives three values of  $x$  and their corresponding values of  $h(x)$  for the given function  $h$ ?

- A)
 

$x$	1	2	3
$h(x)$	4	5	6
- B)
 

$x$	1	2	3
$h(x)$	-2	1	6
- C)
 

$x$	1	2	3
$h(x)$	-1	1	3
- D)
 

$x$	1	2	3
$h(x)$	-2	1	3

20

In the linear function  $f$ ,  $f(0) = 8$  and  $f(1) = 12$ . Which equation defines  $f$ ?

- A)  $f(x) = 12x + 8$
- B)  $f(x) = 4x$
- C)  $f(x) = 4x + 12$
- D)  $f(x) = 4x + 8$

21

$$14j + 5k = m$$

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

- A)  $k = \frac{m - 14j}{5}$
- B)  $k = \frac{1}{5}m - 14j$
- C)  $k = \frac{14j - m}{5}$
- D)  $k = 5m - 14j$

22

$$RS = 440$$

$$ST = 384$$

$$TR = 584$$

The side lengths of right triangle  $RST$  are given. Triangle  $RST$  is similar to triangle  $UVW$ , where  $S$  corresponds to  $V$  and  $T$  corresponds to  $W$ . What is the value of  $\tan W$ ?

- A)  $\frac{48}{73}$
- B)  $\frac{55}{73}$
- C)  $\frac{48}{55}$
- D)  $\frac{55}{48}$

**STOP**

If you finish before time is called, you may check your work on this module only.  
Do not turn to any other module in the test.