



# PSAT<sup>™</sup> 8/9

# Practice Test #2

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This version of the PSAT 8/9 Practice Test is for students who will be taking  
the digital PSAT 8/9 in nondigital format.



**PSAT<sup>™</sup> 8/9**

6VRL03



**Test begins on the next page.**

# Reading and Writing

## 33 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

The following text is adapted from Lewis Carroll’s 1871 novel *Through the Looking-Glass, and What Alice Found There*. Alice, a child, is talking to her cat.

“Do you hear the snow against the window-panes, Kitty? How nice and soft it sounds! Just as if someone was kissing the window all over outside.”

As used in the text, what does the word “soft” most nearly mean?

- A) Gentle
- B) Sensitive
- C) Shapeless
- D) Bland

2

The following text is adapted from Charles Chesnutt’s 1899 story “The Wife of His Youth.” Mr. Ryder is hosting a formal gathering where he will propose marriage to the woman he has been courting.

[A] younger and less cautious man would long since have spoken. But he had made up his mind, and had only to determine the time when he would ask her to be his wife. He decided to give a ball in her honor, and at some time during the evening of the ball to offer her his heart and hand.

As used in the text, what does the word “determine” most nearly mean?

- A) Choose
- B) Influence
- C) Demonstrate
- D) Measure

3

It would be a mistake to \_\_\_\_\_ the exhibit that artist and curator Joe Baker, who is a member of the Lenape (Delaware) people, has organized at the Brooklyn Public Library. The exhibit, which includes Lenape beadwork from the 1850s as well as modern works that use traditional patterns, is essential viewing.

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

- A) complicate
- B) amplify
- C) overlook
- D) assemble

4

Archaeologist Erika Karuzas works with the Confederated Salish and Kootenai Tribes of Montana to preserve culturally significant sites. In 2015 they decided that creating a new national trail connecting many of these sites would \_\_\_\_\_ their preservation efforts, because the US government provides some protections to national trails that aren't given to other areas.

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

- A) inspire
- B) ignore
- C) promote
- D) reduce

5

Researcher Lucy Salazar is using radiocarbon dating to study Machu Picchu, an ancient Incan fortress in the Andes Mountains. She and her colleagues have found that the site's age differs from the \_\_\_\_\_ estimate: it is approximately 20 years older than scholars thought when first encountering Machu Picchu in 1911.

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

- A) genuine
- B) intentional
- C) independent
- D) original

6

The following text is adapted from Jason Reynolds's 2016 novel *Ghost*. The narrator, who is in middle school, is at a bus stop.

I just go there [to the bus stop] to look at the people working out. See, the gym across the street has this big window—like the whole wall is a window—and they have those machines that make you feel like you walking up steps and so everybody just be facing the bus stop, looking all crazy like they're about to pass out. And trust me, there ain't nothing funnier than that. So I check that out for a little while like it's some kind of movie: *The About to Pass Out Show*, starring stair-stepper person one through ten.

©2016 by Jason Reynolds

Which choice best states the main purpose of the text?

- A) To give a reason why the narrator is excited to start middle school
- B) To describe an activity that the narrator finds amusing
- C) To explain a problem that the narrator has overcome
- D) To discuss a movie that the narrator saw in a theater

7

In 2020, rap artist and professor A.D. Carson published the first peer-reviewed rap album about his experiences with Black masculinity called “i used to love to dream.” Typically in peer review, experts evaluate scholarly articles prior to publication. For Carson’s album, dubbed a “mixtape/e/essay,” peer review involved both scholars and rap artists. In combining elements of a mixtape album with scholarly essays that connect Carson’s lyrics to historical and contemporary contexts for listeners both inside and outside academia, Carson’s album helped redefine how scholarship is created and shared.

Which choice best states the main purpose of the text?

- A) To compare the relative public impact of scholarly articles and albums
- B) To capture one scholar’s opinion of a new rap album
- C) To explain why a certain rap album is particularly innovative
- D) To describe how each step of the peer review process unfolds

8

Historians have argued that a crucial component of the Civil Rights Movement’s success in the 1960s was the Southern Christian Leadership Conference’s Citizen Education Program (CEP), which invited promising activists from across the South to its one-week training sessions in Dorchester, Georgia. Led by experienced organizers such as Dorothy Cotton and Septima Clark, CEP attendees—more than 7,000 in all—participated in workshops on topics ranging from public speaking to legal doctrine before returning home and using their newly acquired knowledge to spearhead local civil rights initiatives.

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

- A) It underscores the extent of the CEP’s impact on the Civil Rights Movement of the 1960s.
- B) It illustrates the CEP organizers’ efforts to educate participants on a wide variety of topics.
- C) It suggests that CEP attendees held a diverse array of opinions about the Southern Christian Leadership Conference’s political philosophy.
- D) It establishes that criticism of the CEP was limited to a few individuals in the Southern Christian Leadership Conference.

9

**Text 1**

Flamingos are known for their vibrant pink coloring, but they're actually born with gray feathers. Their pink color comes from eating brine shrimp, but brine shrimp aren't naturally pink either. Animals can't produce carotenoids, the pigments that provide the pink hue. The algae that brine shrimp feed on, however, can produce these pigments. Thus, the pinker the flamingo, the more shrimp it has eaten.

**Text 2**

Ecologist Juan Amat has found that flamingos apply a kind of makeup to make themselves appear pinker. A gland near their tail contains pigments that come from the food they eat. When the flamingos groom themselves using the pigments, their feathers become pinker. Flamingos may do this to improve their success during mating season, when they would benefit from looking pinker.

Based on the texts, how would the ecologist in Text 2 most likely respond to the author's conclusion in Text 1?

- A) By emphasizing that flamingos' tail feathers are pinker than their other feathers are
- B) By claiming that the coloring of flamingos' feathers doesn't change significantly enough for most observers to notice
- C) By pointing out that the amount of shrimp eaten isn't the only thing that influences flamingos' coloring
- D) By arguing that flamingos' diet doesn't include much shrimp except during mating season

10

The following text is from Beatrice Harraden's 1894 novel *Ships that Pass in the Night*.

In an old second-hand bookshop in London, an old man sat reading Gibbon's *History of Rome*. He did not put down his book when the postman brought him a letter. He just glanced indifferently at the letter, and impatiently at the postman. Zerviah Holme did not like to be interrupted when he was reading Gibbon; and as he was always reading Gibbon, an interruption was always regarded by him as an insult.

Based on the text, how did Zerviah Holme most likely feel when the letter was delivered?

- A) He felt relieved because he had been expecting an important letter.
- B) He felt excited because the letter was from a good friend.
- C) He felt sad because the postman did not stop to talk with him before leaving.
- D) He felt annoyed because he was interrupted while reading his favorite author.

11

During the World War II era, some Mexican American women adopted a striking new look called *pachuca* style. They wore altered men's jackets or zoot suits (wide-legged, long-coated suits) and dramatic makeup, and they combed their hair into high, rounded shapes. Some people criticized *pachuca* style, saying it was dangerous and women should dress traditionally. But historians see things differently. They see *pachuca* style as a form of rebellion against the era's rigid social expectations for women. They say that it showed a desire for self-expression and freedom on the part of women who adopted the style.

According to the text, how do historians view *pachuca* style?

- A) They think that *pachuca* style was such a popular trend that it continues to influence fashion in the United States to the present day.
- B) They think that *pachuca* style was a way for some Mexican American women to express themselves and resist strict social expectations.
- C) They think that *pachuca* style was celebrated because it enabled some Mexican American women to show their support for the United States during World War II.
- D) They think that *pachuca* style was similar to other fashion trends that different groups of women adopted in the same period.

12

Paleontologist Alan Tennyson and colleagues studied fossil bones found in New Zealand that are more than 55 million years old. The researchers determined that the fossil bones belonged to two previously unknown species of prehistoric penguins. Moreover, they estimated that one of the two penguin species was more than three times the size of the emperor penguin, which is the largest penguin species that exists today.

Based on the text, which choice best describes the two previously unknown penguin species?

- A) They are frequently studied by paleontologists.
- B) They are no longer living species.
- C) They were smaller than penguin species that exist today.
- D) They spent little of their lives in water.

13

Using the Stratospheric Observatory for Infrared Astronomy (SOFIA), a team of astronomers mapped out the magnetic field of G47, one of the Milky Way's galactic bones (dense clouds of gas and dust that run through the middle of the arm of a spiral galaxy). Surprisingly, the map revealed a magnetic field with no clear pattern or direction. The researchers had expected the magnetic field to be similar to the more uniform fields seen in galactic bones in other arms of the Milky Way.

According to the text, what was surprising about the researchers' mapping of the magnetic field of galactic bone G47?

- A) It showed a weaker magnetic field than expected.
- B) It implied that previous mappings of the magnetic field were inaccurate.
- C) It produced magnetic field measurements similar to those for other galactic bones.
- D) It revealed a magnetic field that wasn't uniform.



14

Artificial leaves are a developing renewable energy technology that mimics the process of photosynthesis in plants. These devices are silicon-based solar cells coated in chemical catalysts that activate reactions that split water molecules into hydrogen and oxygen gas. The technology, while generating lots of interest, is not yet commercially viable as a large-scale energy source. To meet this challenge, scientists from many fields are researching ways to store, transport, and distribute the energy the devices produce while other scientists are working to improve the cost and efficiency of the devices.

Which choice best states the main idea of the text?

- A) Continued research and development in artificial-leaf technology is needed before the devices can be widely used as an energy source.
- B) The recent increase in the commercial use of artificial leaves as an energy source has encouraged many scientists to research ways to improve the technology.
- C) Artificial leaves split water molecules into oxygen and hydrogen gas using catalysts more efficiently than plants do using the process of photosynthesis.
- D) Artificial leaves were developed to mimic the natural process of photosynthesis in plants in order to store energy for long-term commercial use.

15

Number of Museum Visits (in Millions)  
from 2016 to 2019

Museum	2016	2017	2018	2019
National Museum of the American Indian	1.1	1.2	1.1	0.96
National Museum of African American History and Culture	0.73	2.4	1.9	2.0

A student is researching the number of visits each year to two museums, the National Museum of the American Indian and the National Museum of African American History and Culture. Of the four years included in the table, the year when both museums had the highest number of visits was \_\_\_\_\_

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

- A) 2016.
- B) 2018.
- C) 2019.
- D) 2017.

16

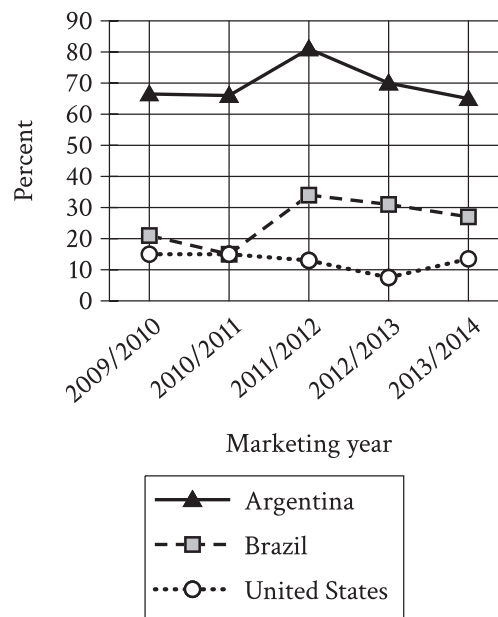
Researchers Narelle Haworth and Amy Schramm studied bicycling behavior in Queensland, Australia. Haworth and Schramm asked adult bike riders questions about their level of experience, reasons for riding a bike, and route preferences. The researchers claim that experienced riders who mainly bike to work tend to prefer routes that reduce their travel time.

Which survey response from a bike rider in Queensland would best support the underlined claim?

- A) “I have a bike, but I don’t ride it very often. When the weather is nice, I sometimes use my bike to go into town to do some shopping.”
- B) “I just got a new bike, and I’m looking forward to going on rides with my friends soon.”
- C) “I bike to my job every day. There’s a nice bike path that goes through a park, but I use the bike lane on the main road because it’s faster.”
- D) “I usually bike to work, but I’m taking the bus now because my bike has a broken part that needs to be fixed.”

17

Percentage of Maize Exported  
by Three Countries for Marketing  
Years 2009/2010–2013/2014



Argentina, Brazil, and the United States are among the world’s leading producers of maize (corn), and each country exports a certain percentage of maize each marketing year, which runs from March to February in Argentina and Brazil and from September to August in the United States. A student is researching those percentages and finds that for the marketing year 2012/2013, the percentage of maize exported by \_\_\_\_\_

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

- A) Brazil increased from the previous marketing year but remained lower than the percentage exported by the United States.
- B) Brazil exceeded the percentage exported by Argentina for the first time.
- C) Argentina decreased from the previous marketing year but remained the highest among the three countries.
- D) the United States reached its highest point during the five marketing years.

18

Marine archaeologists have found much of the wooden hull of a sixteenth-century ship in a flooded quarry in southeast England. When it is exposed to air and water, wood rots quickly unless it is protected by sediment that shields it from oxygen. Therefore, the discovered ship was likely \_\_\_\_\_

Which choice most logically completes the text?

- A) covered by a protective sediment layer in the quarry.
- B) one of several other ships buried in the same quarry.
- C) a confirmation of previous theories about the type of wood that was used in sixteenth-century ships.
- D) first constructed much earlier than previously thought.

19

In 2009, researchers determined that pottery fragments from a cave in China were close to 18,000 years old. These are some of the oldest \_\_\_\_\_ of pottery ever found.

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

- A) pieces:
- B) pieces,
- C) pieces
- D) pieces—

20

Azulejos, mosaics made of glazed ceramic tiles, can be found throughout Portugal. These mosaics beautify places such as \_\_\_\_\_ stations, and public squares.

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

- A) libraries train
- B) libraries: train
- C) libraries—train
- D) libraries, train

21

Located in the northern United States, the Great Lakes Basin contains roughly 35,000 islands. Lake Superior has Grand Island, for example. Lake Michigan has Belle Isle. Lake Huron, though, is home \_\_\_\_\_ the largest island of them all: Manitoulin Island.

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

- A) to;
- B) to—
- C) to
- D) to,

22

The First Folio, published in 1623, is the first collection of William Shakespeare’s plays. The collection \_\_\_\_\_ 18 plays that might otherwise have been lost, such as *Julius Caesar* and *Macbeth*.

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

- A) to be including
- B) including
- C) to include
- D) includes

23

Multiple newspapers \_\_\_\_\_ the Spanish-speaking population of Washington, DC, including *El Tiempo Latino* and *Washington Hispanic*.

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

- A) serve
- B) having served
- C) to serve
- D) serving

24

In the Inca Empire (1438–1533), ayllus \_\_\_\_\_ family clans that ranged in size from small groups to thousands of people.

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

- A) is
- B) was
- C) has been
- D) were

25

The city of Amsterdam partnered with consultants to develop Public Eye—an ethical AI-powered crowd-monitoring \_\_\_\_\_ video streamed from cameras in heavily touristed areas, the AI algorithm determines crowd sizes without, in the interest of protecting individuals’ privacy, retaining the footage.

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

- A) system—analyzing
- B) system, analyzing
- C) system. Analyzing
- D) system analyzing

26

Ballet dancer Misty Copeland has accomplished a lot. She has appeared on Broadway, toured with Prince, and even served on the President’s Council on Sports, Fitness & Nutrition. \_\_\_\_\_ according to Copeland, nothing in her career matches the honor of being the first African American woman named principal dancer at the prestigious American Ballet Theatre.

Which choice completes the text with the most logical transition?

- A) Thus,
- B) However,
- C) For example,
- D) Second of all,

27

Preston Singletary is a Tlingit glass artist who often collaborates with other artists. \_\_\_\_\_ he has worked with Tewa pottery artist Jody Naranjo several times. Together, Singletary and Naranjo have created pottery-inspired glass pieces such as *Sunset Stampede* and *Kiva Steps*.

Which choice completes the text with the most logical transition?

- A) In conclusion,
- B) For example,
- C) However,
- D) In comparison,

28

The 435 state districts in the US House of Representatives are designed to be roughly equal in population. These districts average around 760,000 people in size. However, only about 730,000 people live in the state of Alaska. \_\_\_\_\_ Alaska has just one House district, encompassing the entire state.

Which choice completes the text with the most logical transition?

- A) As a result,
- B) Instead,
- C) Finally,
- D) For instance,

29

A 2022 study by researchers Hala Altamimi and Qiaozhen Liu investigated the relationship between nonprofit arts organizations’ spending and performance. \_\_\_\_\_ the researchers examined the correlation between how much 22,328 US arts nonprofits spent on overhead—operational costs such as equipment and fundraising—and how many people attended their events (a measure of overall success).

Which choice completes the text with the most logical transition?

- A) Thus,
- B) In addition,
- C) By comparison,
- D) Specifically,

30

Ugandan American professor Peter Nazareth believed that Elvis Presley’s music is best understood not as a homogeneous collection but as an anthology (because Elvis showcased the contributions of a wide range of gospel, blues, and rock artists). \_\_\_\_\_ Nazareth entitled his college course on Elvis and his music, which focused on Elvis’s many musical influences, “Elvis as Anthology.”

Which choice completes the text with the most logical transition?

- A) To that end,
- B) In sum,
- C) That is,
- D) In addition,

31

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

- In 1897, twenty Black US Army infantrymen rode bicycles from Montana to Missouri.
- The 1,900-mile journey took forty-one days.
- The goal was to test the idea of forming a military bicycle corps.
- In 2022, Erick Cedeño, a Black long-distance cyclist, reenacted the journey.
- Cedeño wanted to honor the infantrymen on the journey’s 125th anniversary.

The student wants to emphasize how far the infantrymen traveled. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- A) The US infantrymen rode their bicycles from Montana to Missouri—traveling a total of 1,900 miles.
- B) The 125th anniversary of the infantrymen’s journey was in 2022.
- C) The goal of the 1897 journey was to test the idea of forming a military bicycle corps.
- D) Over a century later, Erick Cedeño honored the infantrymen by reenacting their 1897 journey.

32

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

- Crown shyness is a phenomenon in which the tops (crowns) of neighboring trees grow close together but don't overlap.
- To explain how this happens, Australian forester M.R. Jacobs proposes the mutual abrasion theory.
- According to Jacobs's theory, when trees brush against one another, branches break off.
- Malaysian scholar Francis S.P. Ng posits the mutual shade avoidance theory.
- According to Ng's theory, when tree branches detect shade from nearby trees' branches, they stop growing.

The student wants to compare the causes of crown shyness proposed in the two theories. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- While Jacobs proposes that crown shyness is caused by neighboring tree branches brushing against one another, Ng posits that it occurs when branches detect shade from nearby trees' branches.
- Both Jacobs and Ng have proposed theories to explain what causes crown shyness.
- Ng posits the mutual shade avoidance theory, whereas Jacobs proposes an alternative theory.
- Jacobs's mutual abrasion theory proposes that when neighboring trees brush against one another, branches break off, resulting in a phenomenon in which the tops of trees grow close together but don't overlap.

33

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

- Thailand's annual Songkran Water Festival is held each April.
- It marks Songkran, the traditional Thai New Year.
- People splash and spray each other for fun at the festival's community-wide water fights.
- In Bangkok, thousands gather along Silom Road for the city's largest water fight.
- In Chiang Mai, thousands gather at a historical monument called the Tha Phae Gate for the city's largest water fight.

The student wants to emphasize a similarity in how people in Bangkok and Chiang Mai celebrate Songkran. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- The largest water fight in Bangkok takes place along a city street, whereas the largest water fight in Chiang Mai takes place at a historical monument.
- In both Bangkok and Chiang Mai, thousands gather to celebrate Songkran with water fights.
- People in both Bangkok and Chiang Mai celebrate Songkran, but they don't do so in exactly the same way.
- Each April, people in Thailand celebrate Songkran, the traditional Thai New Year.

## 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

## 33 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).

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1

When marine biologist Brittany Williams played different ocean recordings to groups of oyster larvae, groups that heard sounds of a healthy oyster reef were the most \_\_\_\_\_. They were twice as likely as other groups to show signs of making a permanent home. This suggests that playing recordings of a healthy ocean reef may encourage oysters to create such a reef.

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

- A) responsive
- B) inactive
- C) liked
- D) distressed

2

The following text is from Darcie Little Badger’s 2021 novel *A Snake Falls to Earth*. Nina is looking at old family photographs.

Nina couldn’t stop looking at the sepia-toned photograph in an oak frame. Propped on the window ledge, it featured a portrait of Great-Great-Grandmother Rosita as a young woman.

©2021 by Darcie Little Badger

As used in the text, what does the word “featured” most nearly mean?

- A) Displayed
- B) Questioned
- C) Approved
- D) Ignored



3

The following text is from Mark Oshiro’s 2018 novel *Anger Is a Gift*. In the novel, Moss and his friends are on a subway train in Northern California.

Lights from the outside world then filled the train car as it rose out of the ground and climbed the elevated track. As long as Moss had lived in West Oakland, he’d never tired of this specific view, so he pointed toward the windows. “Check it,” he said, and the Port of Oakland began to pass by them.

©2018 by Mark Oshiro

As used in the text, what does the word “specific” most nearly mean?

- A) Imaginary
- B) Energetic
- C) Correct
- D) Particular

4

Manul cats are small, shy felines. They live mostly alone in out-of-the-way parts of Asia, such as on Mount Everest. These cats have been difficult to research because their habitats are so \_\_\_\_\_ large populations of humans.

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

- A) full of
- B) drawn to
- C) responsible for
- D) distant from

5

The following text is adapted from José Martí’s 1891 poem “At the Salon” (translated by Cecil Charles in 1898). The speaker describes a painting featuring a female figure.

From the sterile soil no ray  
Of hope in a blade of green,  
Nor sheltering roof is seen—  
Though the skies are heavy and gray.

Ah, this is the woman fair  
Who stole away my heart  
In the splendid halls of art  
Yester-e’en as I wandered there!

As used in the text, what does the word “sheltering” most nearly mean?

- A) Protective
- B) Restrictive
- C) Affectionate
- D) Suspicious

6

Were penguins always flightless? Theresa Cole and her team argue that penguins could fly at some point, but that they lost that ability more than 60 million years ago as they adapted to marine life. After examining various penguin fossils and genetic information, the researchers concluded that over time penguins developed underwater vision, blood oxygenation, and bone density better suited for swimming than flying. Thus, environmental conditions might have driven penguins to change from flyers to swimmers.

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

- A) It defines a scientific term used in the sentence that follows.
- B) It contradicts a description in the sentence that follows.
- C) It provides an answer to the question in the previous sentence.
- D) It notes that the question in the previous sentence has not been researched.

7

Very little is known about the role nocturnal insects, such as moths, play in flower pollination because it is difficult to monitor insects at night. To address this problem, a team of scientists used time-lapse cameras to record pollinator visits to red clover all day and night. The recordings showed that while most pollinator visits were by bumblebees, one-third of visits were by moths. Additionally, flowers that were visited by both moths and bees produced more seeds than flowers that were only visited by bees.

Which choice best states the function of the underlined sentence?

- A) To describe an approach a team of scientists used to study pollinators
- B) To question a claim scientists make about pollinators
- C) To explain why moths prefer red clover to other flowers
- D) To announce an unexpected research finding about red clover

8

The following text is adapted from Louise Erdrich’s 2020 novel *The Night Watchman*. Louis Pipestone is collecting signatures for a petition from fellow members of the Turtle Mountain Band of Chippewa on the tribe’s reservation in North Dakota.

Louis Pipestone tended the petition like a garden. He kept it with him at all times. In town, his eyes sharpened when he noticed a tribal member who hadn’t yet signed. Wherever they were—at the gas pump, mercantile [general store], at Henry’s [Café], on the road, or outside the clinic and hospital—Louis cornered them. If they were waiting for a baby to be born, he’d have them sign. If they were laughing, if they were arguing. If they were taking a child home from school, they signed.

©2020 by Louise Erdrich

Which choice best states the main purpose of the text?

- A) To suggest that some tribal members refuse to sign the petition because they dislike Louis Pipestone
- B) To show that attitudes toward the petition within the tribal community change over time
- C) To demonstrate that most tribal members are enthusiastic about signing the petition
- D) To portray Louis Pipestone’s strong commitment to collecting signatures for the petition

9

Today composer Scott Joplin is mainly celebrated for his catchy ragtime pieces “Maple Leaf Rag” and “The Entertainer.” However, by overlooking his less famous works, listeners will miss the full range of Joplin’s creativity. For instance, his waltz “Pleasant Moments” and his opera *Treemonisha* skillfully blend ragtime and classical music. These masterpieces deserve as much fame as Joplin’s biggest hits.

Which choice best states the main purpose of the text?

- A) To describe the similarities and differences between ragtime music and opera
- B) To argue that more attention should be given to Joplin’s lesser-known works
- C) To encourage music lovers to listen to music by many different composers
- D) To explain how Joplin learned to compose and perform ragtime music

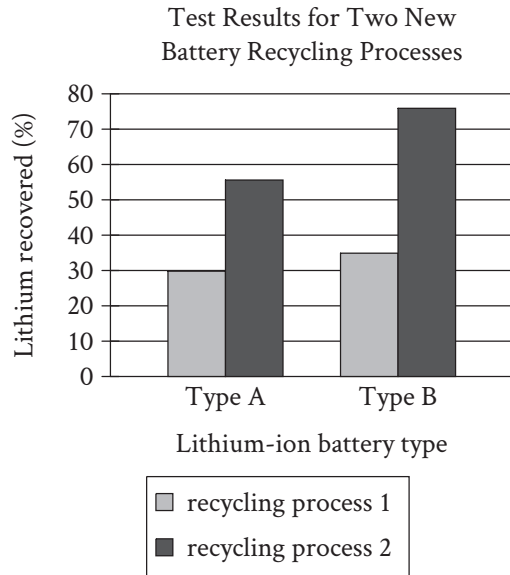
10

A contraction of “you all,” the pronoun “y’all” has long been used as a plural version of “you” in the South and in Black communities around the US. In recent decades, most other English-speaking communities in the US have begun to use “y’all.” What explains its rise in popularity? Many varieties of English have no pronoun that specifically addresses more than one person and instead must use “you” to address both one person and more than one. But “y’all” always refers to two or more people. As a result, it conveys the speaker’s meaning more precisely than “you” can.

Which question does the text most directly attempt to answer?

- A) How many other plural versions of the pronoun “you” are there in English, besides “y’all”?
- B) Why has the pronoun “y’all” become more widely used in the US?
- C) When was the first recorded use of the pronoun “y’all” in the English language?
- D) Is “y’all” commonly used in English-speaking regions of the world besides the US?

11



A team of scientists wants to improve the recycling of two of the most common types of lithium-ion batteries used in electronic devices. The team tested two new processes that involve grinding battery materials and aluminum foil together. The highest percentage of lithium recovered in the tests was closest to \_\_\_\_\_

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

- A) 75%.
- B) 10%.
- C) 45%.
- D) 20%.

12

Estimated Impacts of Invasive Predator Species on Threatened Birds, Mammals, and Reptiles

Invasive predator species	Estimated impact on threatened birds	Estimated impact on threatened mammals	Estimated impact on threatened reptiles
Mongoose	0.66	0.75	0.44
Dogs	0.67	0.57	0.44
Cats	0.74	0.61	0.52

How harmful are invasive predators to threatened species? To find out, researchers assigned values from 0.25 to 1.00 to various harms caused by invasive predators. The researchers then used these values to estimate the extent to which several invasive predator species have harmfully impacted threatened birds, mammals, and reptiles. In the table, higher numbers represent greater impacts. The estimated impact of invasive mongooses on threatened mammals is \_\_\_\_\_

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

- A) 0.35.
- B) 0.61.
- C) 0.75.
- D) 0.52.

13

Biologists have generally believed that the diet of jaguars consists mostly of land-based mammals, but researchers studying a population of jaguars living in the Brazilian Pantanal, a tropical wetland, claim that jaguars can survive on a diet of more fish and aquatic reptiles than mammals.

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

- A) Aquatic reptile and fish remains were detected more often than were mammal remains in an analysis of jaguar waste matter found in the area.
- B) Exceptionally high numbers of yacare caiman, an aquatic reptile, were found living in the area.
- C) Aquatic prey like the reptiles and fish in the area provide a source of omega-3 fatty acids that aren't often found in land mammals.
- D) When jaguars in the area preyed on mammals, they tended to prefer semiaquatic ones like capybaras.

14

East Australian humpback whales migrate up to 10,000 kilometers each year to reach their breeding grounds. Researchers long believed that migrating whales live only on the extra energy they stored up during the feeding season. But marine biologist Vanessa Pirotta and her team aren't so sure. They analyzed 20 years of observations of the migrating whales made by citizen scientists (members of the public who help collect data for scientific research). The team claims that the whales may not live only on their stored energy during migration.

Which finding, if true, would most directly support the team's claim?

- A) Citizen scientists have observed many different types of marine animals feeding alongside the whales.
- B) Citizen scientists have made many observations of the whales feeding as they migrate to their breeding grounds.
- C) Citizen scientists have made more observations of the whales migrating to their breeding grounds than of the whales returning to their feeding grounds.
- D) Citizen scientists have recently begun to observe the whales migrating to their breeding grounds earlier in the year.

15

In countries with right-hand traffic, drivers who want to make a left turn at a traffic intersection with stoplights have to wait for either a gap in oncoming traffic or a designated left-turn signal to turn green. At busy intersections, this often causes a backup of vehicles waiting to turn left or being prevented from proceeding by left-turning vehicles in front of them. Transportation researcher Vikash V. Gayah claims that in urban areas eliminating the option to turn left at busy intersections—both with and without dedicated left-turn signals—would improve traffic flow and, as a result, reduce overall travel times even if such a restriction would require drivers to sometimes travel a slightly longer distance.

Which finding, if true, would most directly support the researcher’s claim?

- A) In a town that installed left-turn signals at all busy intersections, seven out of ten survey respondents agreed with the statement “the streets in my community are easier to navigate by motor vehicle than before.”
- B) A traffic study of intersections in a large city shows that on average drivers wait longer to make a left turn at intersections without left-turn signals than at intersections with such signals.
- C) After a city eliminated left turns at busy intersections, a package-delivery company reports that its drivers have been able to reach more addresses in the city daily, on average, and therefore deliver more packages there annually.
- D) Statistics reveal that school buses in a city that eliminated left turns at most intersections took on average two minutes longer to complete their routes after the restriction took effect than they did before.

16

Zines are small-scale, self-printed magazines. They have been around since the Black literary zine *Fire!!* was created in the 1920s. Since then, zines have appealed to creators looking for an inexpensive form of expression to share with a select audience. Zine creators often mix art with social commentary and challenge mainstream culture. At first, the internet appeared to replace the zine, but this old form persists. Today, there are enough zines in the United States to support annual zine festivals. This suggests that \_\_\_\_\_

Which choice most logically completes the text?

- A) creators can reach a larger audience by posting online.
- B) zines are still a meaningful form of expression.
- C) creators can continue to explore new art forms.
- D) zines are good sources of mainstream culture.

17

In a three-year study of parasitic infections by *Anomotaenia brevis* tapeworms in *Temnothorax nylander* ants, entomologist Susanne Foitzik and colleagues found something unexpected: rather than reducing its host's fitness, as is typical of parasites, *A. brevis* greatly extends the lifespan of a *T. nylander* worker ant and seems to halt the effects of aging. Furthermore, those infected receive special treatment, ceasing their share of labor to sustain the colony and remaining in the nest as uninfected workers feed, groom, and transport them. By contrast, the researchers observed that uninfected workers in parasitized colonies have shortened lifespans, most likely because the \_\_\_\_\_

Which choice most logically completes the text?

- A) uninfected workers are at high risk for direct exposure to *A. brevis* in the course of providing social care to the infected workers in the nest.
- B) need to compensate for reduced contributions within the colony while also caring for infected workers is burdensome to the uninfected workers.
- C) high level of activity maintained by the uninfected workers makes them better able than infected workers to quickly disperse when the nest is attacked by a predator.
- D) average lifespan of *T. nylander* worker ants in colonies without parasitic activity typically falls well below three years, the range covered by the study.

18

During their larval phase, numerous species of coral reef fish are drawn toward areas where light is present. To better understand how artificial light at night (ALAN) might affect some coral reef fish, researchers explored the effect of exposure to low levels of ALAN on the reproductive success of the common clownfish (*Amphiprion ocellaris*). While exposure to low levels of ALAN had no significant effect on spawning frequency and egg fertilization in *A. ocellaris*, incubation in the presence of ALAN completely inhibited hatching. These findings suggest that \_\_\_\_\_

Which choice most logically completes the text?

- A) *A. ocellaris* that settle in areas with low levels of ALAN have significantly higher rates of successful egg fertilization than *A. ocellaris* that settle in areas without ALAN do.
- B) the reproductive success of *A. ocellaris* would be at risk if they were to selectively settle in regions that are regularly exposed to low levels of ALAN.
- C) the reproductive success of *A. ocellaris* is more greatly affected by the presence of low levels of ALAN during incubation than the reproductive success of other species of coral reef fish is.
- D) the spawning frequency of *A. ocellaris* was more strongly affected by the presence of low levels of ALAN than egg fertilization was, though both were less affected than incubation.

19

The element carbon has the highest melting point \_\_\_\_\_ all the elements on the periodic table—3,500 degrees Celsius.

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

- A) of
- B) of—
- C) of,
- D) of:

20

By analyzing ice cores from Greenland and Antarctica, a research team at Sweden’s Lund University discovered evidence of a solar storm that occurred 9,200 years ago. Scientists had previously thought the Sun to be in a relatively “quiet” phase at that \_\_\_\_\_ the Lund team’s finding suggests otherwise.

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

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

21

According to the traditional RYB (red-yellow-blue) color model, yellow is a complementary color to purple. However, yellow \_\_\_\_\_ considered complementary to blue in modern color theory.

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

- A) is
- B) having been
- C) to be
- D) being

22

With residents from Mexico, China, El Salvador, and many other countries, Los Angeles has long been a city of cultural diversity. Even back in the 1860s, nearly 30% of the city’s population \_\_\_\_\_ from outside the United States.

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

- A) is being
- B) was
- C) is
- D) will be

23

According to the University of Hawai’i at Mānoa, aloha ‘āina is “a recognition, commitment, and practice sustaining the ea—or life breath” between the Hawaiian people and their natural environments. The concept has been proudly embodied \_\_\_\_\_ Native Hawaiians for generations, contributing to the lush flora and renowned beauty of the islands.

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

- A) by;
- B) by:
- C) by,
- D) by

24

The algaita is a double reed wind instrument from West Africa. The reed of a wind instrument is the mouthpiece \_\_\_\_\_ A double reed contains two pieces of cane that vibrate and produce sound as air passes between them.

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

- A) where sound is made?
- B) where is sound made.
- C) where sound is made.
- D) where is sound made?

25

Many Samoans enjoy a sport called kilikiti. This bat-and-ball game was derived from \_\_\_\_\_ kilikiti differs from cricket in a few key ways.

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

- A) cricket but:
- B) cricket but,
- C) cricket, but
- D) cricket, but,



26

In a rural area along the border between Oklahoma and Texas, amateur astronomers gather each year to observe the night sky at the Okie-Tex Star Party. Like most star parties, Okie-Tex takes place in an area with low light pollution, \_\_\_\_\_ dark skies and ideal stargazing conditions.

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

- A) ensuring
- B) this will ensure
- C) ensures
- D) it ensures

27

In the 1950s, novel audio technologies allowed the addition of another instrument to jazz and swing \_\_\_\_\_ relatively quiet instrument, its full range of sound was finally audible alongside the blaring brass instruments of the time, allowing flautists like Bennie Maupin and Bobbi Humphrey to perform with other jazz greats.

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

- A) music, the flute, a
- B) music. The flute, a
- C) music; the flute, a
- D) music: the flute. A

28

Many butterfly species have bold, brightly colored wings. \_\_\_\_\_ some butterfly species have wings that are almost completely colorless and transparent. Glasswing butterflies, for example, have see-through wings that make them nearly invisible.

Which choice completes the text with the most logical transition?

- A) Similarly,
- B) Previously,
- C) In other words,
- D) However,

29

Following the Mata Ortiz pottery technique, Mexican sculptor Juan Quezada Celado starts by creating the base of the pot with a slab of clay. \_\_\_\_\_ he builds the pot walls by layering coils of clay around the perimeter of the base. Celado then smooths out the pot's walls with a hacksaw blade. At last, the pot is ready to be painted.

Which choice completes the text with the most logical transition?

- A) For example,
- B) However,
- C) By contrast,
- D) Next,

30

Scientists long debated the origins of chondrules, tiny glass beads that formed in meteors billions of years ago. For decades, different theories were proposed, from lightning strikes to powerful rock collisions, but none had sufficient evidentiary support. \_\_\_\_\_ scientists found strong evidence that chondrules were formed by shock waves in nearby nebulae.

Which choice completes the text with the most logical transition?

- A) For example,
- B) Therefore,
- C) Similarly,
- D) Finally,

31

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

- Mary Kang is a Korean American portrait photographer.
- She is based in New York City and in Austin, Texas.
- One of Kang's photographs features artist Dominique Fung.
- In the portrait, Fung is seated on the floor.
- Five of Fung's paintings are resting against the wall behind her.

The student wants to describe where Fung is in the photograph to an audience already familiar with Kang and Fung. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- A) Dominique Fung is in a photograph by Mary Kang, a portrait photographer based in New York City and Austin, Texas.
- B) Mary Kang is a photographer based in both New York City and Austin, Texas.
- C) Five paintings by artist Dominique Fung can be seen in the background of Mary Kang's photograph.
- D) In Kang's portrait of her, Fung is seated on the floor, with five of her paintings resting against the wall behind her.

32

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

- The international Slow Food movement was founded in 1989 with the signing of the “Slow Food Manifesto.”
- The movement promotes universal access to healthy, high-quality food.
- It calls for sustainable food production practices that protect local environments, ecosystems, and biodiversity.
- It advocates for fair treatment of and compensation for food production workers.
- The Slow Food USA organization was founded in 2000.

The student wants to introduce the Slow Food movement to a new audience. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- A) The international Slow Food movement, founded in 1989, promotes universal access to healthy, high-quality food that is produced sustainably by workers who are treated and compensated fairly.
- B) The signing of the “Slow Food Manifesto” in 1989 marked the founding of the international Slow Food movement, while the Slow Food USA organization was founded in 2000.
- C) The Slow Food movement advocates for food production workers.
- D) Goals of the movement include universal access to healthy, high-quality food and sustainable food practices.

33

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

- In meteorology, an air mass is a large body of air with generally uniform humidity and temperature.
- Air masses are commonly classified by two-letter names.
- The first letter indicates the humidity of the air mass, while the second letter indicates the temperature.
- cA (continental arctic) means dry and cold, for example.
- mT (maritime tropical) means moist and warm.
- This classification system is based on the work of a Swedish meteorologist named Tor Bergeron (1891–1977).

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

- A) Air masses are large bodies of air with generally uniform humidity and temperature.
- B) The air mass classification system uses two-letter names and is based on the work of Tor Bergeron, a Swedish meteorologist.
- C) Air masses are commonly classified by a two-letter name that indicates humidity and temperature.
- D) One type of air mass is known as a cA, or continental arctic, air mass because it is dry and cold.

## 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.**

# Math

## 27 QUESTIONS

### DIRECTIONS

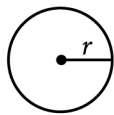
The questions in this section address a number of important math skills. Use of a calculator is permitted for all questions.

### NOTES

Unless otherwise indicated:

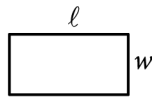
- All variables and expressions represent real numbers.
- Figures provided are drawn to scale.
- All figures lie in a plane.
- The domain of a given function  $f$  is the set of all real numbers  $x$  for which  $f(x)$  is a real number.

### REFERENCE

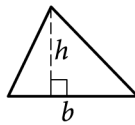


$$A = \pi r^2$$

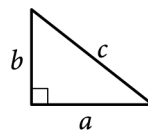
$$C = 2\pi r$$



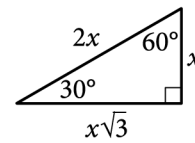
$$A = \ell w$$



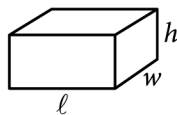
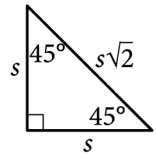
$$A = \frac{1}{2}bh$$



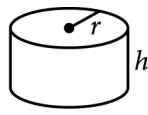
$$c^2 = a^2 + b^2$$



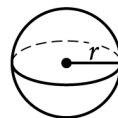
Special Right Triangles



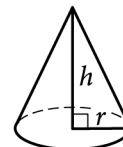
$$V = \ell wh$$



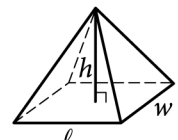
$$V = \pi r^2 h$$



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



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



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

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

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

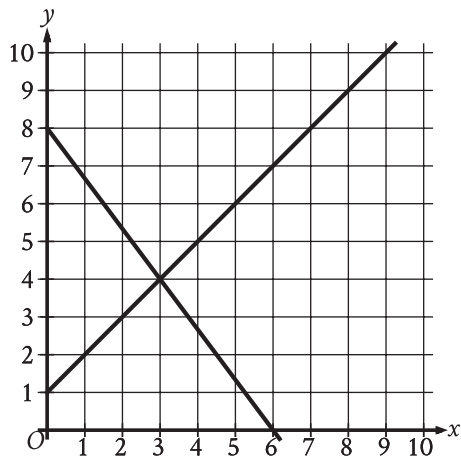
The sum of the measures in degrees of the angles of a triangle is 180.

**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.

**For student-produced response questions**, solve each problem and write your answer next to or under the question in the test book as described below.

- Once you've written your answer, circle it clearly. You will not receive credit for anything written outside the circle, or for any questions with more than one circled answer.
- If you find **more than one correct answer**, write and circle only one answer.
- Your answer can be up to 5 characters for a **positive** answer and up to 6 characters (including the negative sign) for a **negative** answer, but no more.
- If your answer is a **fraction** that is too long (over 5 characters for positive, 6 characters for negative), write the decimal equivalent.
- If your answer is a **decimal** that is too long (over 5 characters for positive, 6 characters for negative), truncate it or round at the fourth digit.
- If your answer is a **mixed number** (such as  $3\frac{1}{2}$ ), write it as an improper fraction ( $\frac{7}{2}$ ) or its decimal equivalent (3.5).
- Don't include **symbols** such as a percent sign, comma, or dollar sign in your circled answer.

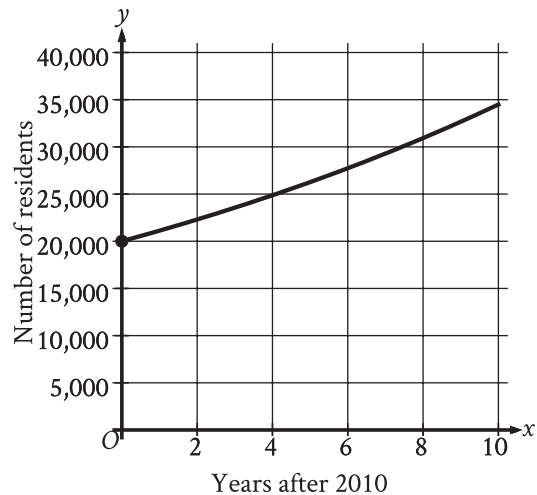
1



The graph of a system of linear equations is shown. What is the solution  $(x, y)$  to the system?

- A) (2, 3)
- B) (3, 4)
- C) (4, 5)
- D) (5, 6)

2

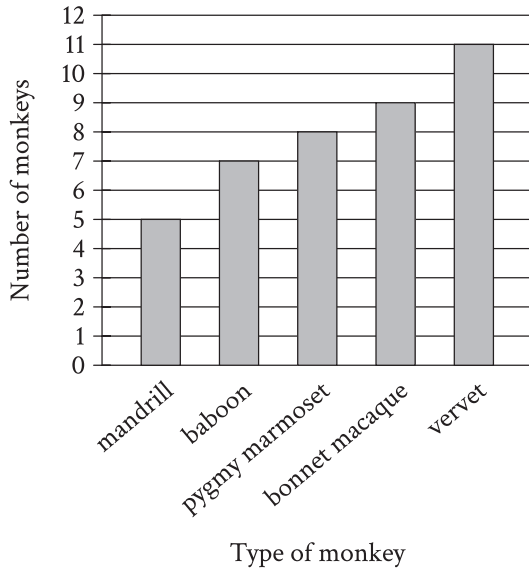


The graph shown models the number of residents of a certain city  $x$  years after 2010. How many residents does this model estimate the city had in 2010?

- A) 0
- B) 2,000
- C) 20,000
- D) 25,000

3

The bar graph shows the number of each type of monkey in a sanctuary.



How many more vervets are in this sanctuary than mandrills?

- A) 11
- B) 6
- C) 5
- D) 3

4

$$3x + 5(x + 4) = 76$$

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

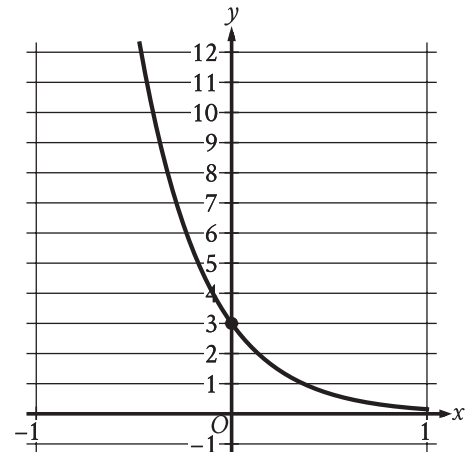
- A) 7
- B) 8
- C) 56
- D) 72

5

The function  $f$  is defined by  $f(x) = \frac{16}{x}$ . What is the value of  $f(x)$  when  $x = 17$  ?

- A)  $\frac{16}{17}$
- B)  $\frac{17}{16}$
- C) 16
- D) 17

6



The graph of the exponential function  $f$  is shown, where  $y = f(x)$ . The  $y$ -intercept of the graph is  $(0, y)$ . What is the value of  $y$  ?

7

For a party, 50 dinner rolls are needed. Dinner rolls are sold in packages of 12. What is the minimum number of packages that should be bought for the party?

8

21 is 21% of what number?

- A) 0
- B) 1
- C) 42
- D) 100

9

To repair a refrigerator, a technician charges \$60 per hour for labor plus \$120 for parts. Which function  $f$  represents the total amount, in dollars, the technician will charge for this job if it takes  $x$  hours?

- A)  $f(x) = x + 120$
- B)  $f(x) = 60x$
- C)  $f(x) = 60x + 120$
- D)  $f(x) = 60x - 120$

10

The function  $f$  is defined by  $f(x) = 80 - 6x$ . What is the value of  $f(7)$  ?

- A) 13
- B) 38
- C) 74
- D) 81

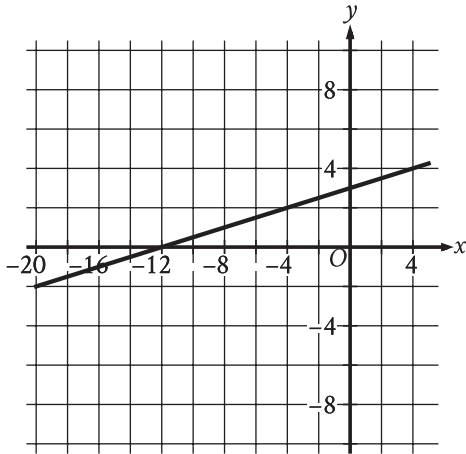
11

Naomi bought both rabbit snails and nerite snails for a total of \$52. Each rabbit snail costs \$8 and each nerite snail costs \$6. If Naomi bought 2 nerite snails, how many rabbit snails did she buy?

- A) 5
- B) 12
- C) 14
- D) 50



12



The graph of the linear function  $f$  is shown, where  $y = f(x)$ . What is the  $x$ -intercept of the graph of  $f$ ?

- A)  $(-12, 0)$
- B)  $(0, 0)$
- C)  $\left(\frac{1}{4}, 0\right)$
- D)  $(12, 0)$

13

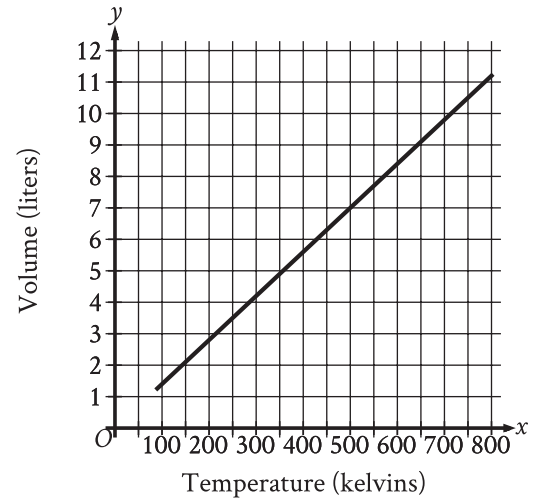
A triangle has a base length of 40 centimeters and a height of 90 centimeters. What is the area, in square centimeters, of the triangle?

14

A participant in a bicycle race completes the race with an average speed of 24,816 yards per hour. What is this average speed, in miles per hour? (1 mile = 1,760 yards)

15

Hydrogen is placed inside a container and kept at a constant pressure. The graph shows the estimated volume  $y$ , in liters, of the hydrogen when its temperature is  $x$  kelvins.



What is the estimated volume, in liters, of the hydrogen when its temperature is 500 kelvins?

- A) 0
- B)  $\frac{7}{500}$
- C) 7
- D)  $\frac{500}{7}$

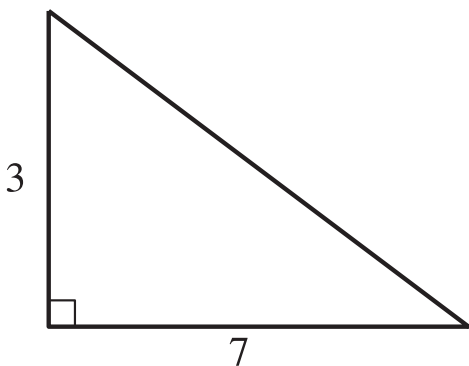
16

$$p + 34 = q + r$$

The given equation relates the variables  $p$ ,  $q$ , and  $r$ . Which equation correctly expresses  $p$  in terms of  $q$  and  $r$ ?

- A)  $p = q + r + 34$
- B)  $p = q + r - 34$
- C)  $p = -q - r + 34$
- D)  $p = -q - r - 34$

17



Note: Figure not drawn to scale.

The lengths of the legs of a right triangle are shown. Which of the following is closest to the length of the triangle's hypotenuse?

- A) 3.2
- B) 5
- C) 7.6
- D) 20

18

The number of coins in a collection increased from 9 to 90. What was the percent increase in the number of coins in this collection?

- A) 10%
- B) 81%
- C) 90%
- D) 900%

19

$$2x + y = 37$$

In triangle  $QRS$ , sides  $QR$  and  $RS$  each have a length of  $x$  centimeters and side  $SQ$  has a length of  $y$  centimeters. The given equation represents this situation. Which of the following is the best interpretation of 37 in this context?

- A) The difference, in centimeters, between the lengths of sides  $QR$  and  $SQ$
- B) The difference, in centimeters, between the lengths of sides  $QR$  and  $RS$
- C) The sum of the lengths, in centimeters, of the three sides of the triangle
- D) The length, in centimeters, of one of the two sides of equal length

20

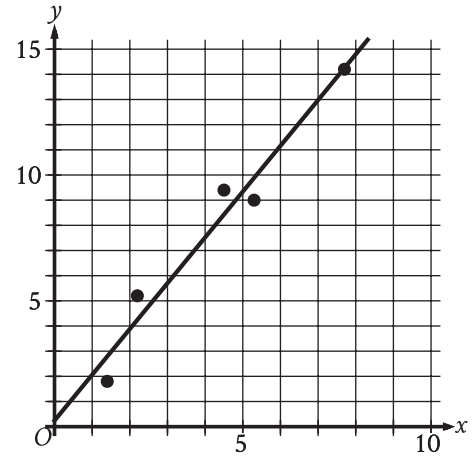
What is the slope of the graph of  $y = \frac{5x}{13} - 23$  in the  $xy$ -plane?

21

To study fluctuations in composition, samples of pumice were taken from 29 locations and cut in the shape of a cube. The length of the edge of one of these cubes is 3.000 centimeters. This cube has a density of 0.230 grams per cubic centimeter. What is the mass of this cube, in grams?

22

In the given scatterplot, a line of best fit for the data is shown.



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

- A) 0.2
- B) 0.7
- C) 1.8
- D) 2.6

23

The length of a rectangle is 50 inches and the width is  $x$  inches. The perimeter is at most 210 inches. Which inequality represents this situation?

- A)  $2x + 100 \leq 210$
- B)  $2x + 100 \geq 210$
- C)  $2x + 50 \leq 210$
- D)  $2x + 50 \geq 210$

24

Which of the following expressions is equivalent to  $8x^{10} - 8x^9 + 88x$  ?

- A)  $x(7x^{10} - 7x^9 + 87x)$
- B)  $x(8^{10} - 8^9 + 88)$
- C)  $8x(x^{10} - x^9 + 11x)$
- D)  $8x(x^9 - x^8 + 11)$

25

$$\frac{3}{5}x + \frac{3}{4}y = 7$$

Which table gives three values of  $x$  and their corresponding values of  $y$  for the given equation?

A)

$x$	$y$
1	$\frac{113}{20}$
2	$\frac{101}{20}$
4	$\frac{77}{20}$

B)

$x$	$y$
1	$\frac{47}{5}$
2	$\frac{44}{5}$
4	$\frac{38}{5}$

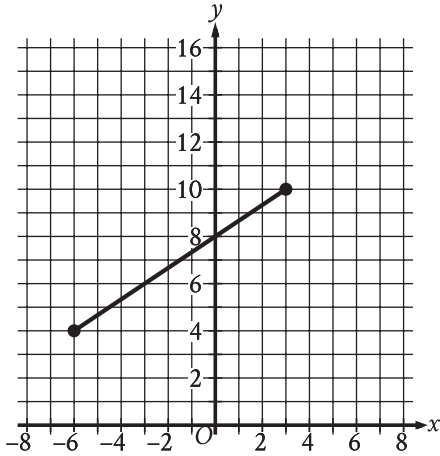
C)

$x$	$y$
1	$\frac{148}{15}$
2	$\frac{136}{15}$
4	$\frac{112}{15}$

D)

$x$	$y$
1	$\frac{128}{15}$
2	$\frac{116}{15}$
4	$\frac{92}{15}$

26



The line segment shown in the  $xy$ -plane represents one of the legs of a right triangle. The area of this triangle is  $36\sqrt{13}$  square units. What is the length, in units, of the other leg of this triangle?

- A) 12
- B) 24
- C)  $3\sqrt{13}$
- D)  $18\sqrt{13}$

27

The solutions to  $x^2 + 6x + 7 = 0$  are  $r$  and  $s$ , where  $r < s$ . The solutions to  $x^2 + 8x + 8 = 0$  are  $t$  and  $u$ , where  $t < u$ . The solutions to  $x^2 + 14x + c = 0$ , where  $c$  is a constant, are  $r + t$  and  $s + u$ . What is the value of  $c$ ?

# 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.**

# Math

## 27 QUESTIONS

### DIRECTIONS

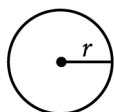
The questions in this section address a number of important math skills. Use of a calculator is permitted for all questions.

### NOTES

Unless otherwise indicated:

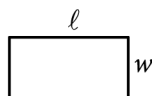
- All variables and expressions represent real numbers.
- Figures provided are drawn to scale.
- All figures lie in a plane.
- The domain of a given function  $f$  is the set of all real numbers  $x$  for which  $f(x)$  is a real number.

### REFERENCE

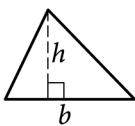


$$A = \pi r^2$$

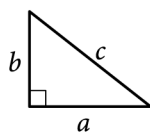
$$C = 2\pi r$$



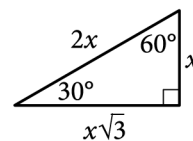
$$A = \ell w$$



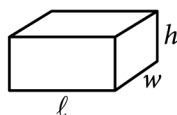
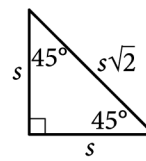
$$A = \frac{1}{2}bh$$



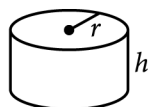
$$c^2 = a^2 + b^2$$



Special Right Triangles



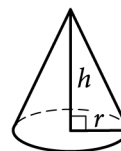
$$V = \ell wh$$



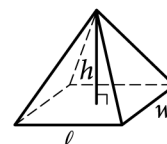
$$V = \pi r^2 h$$



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



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



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

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.

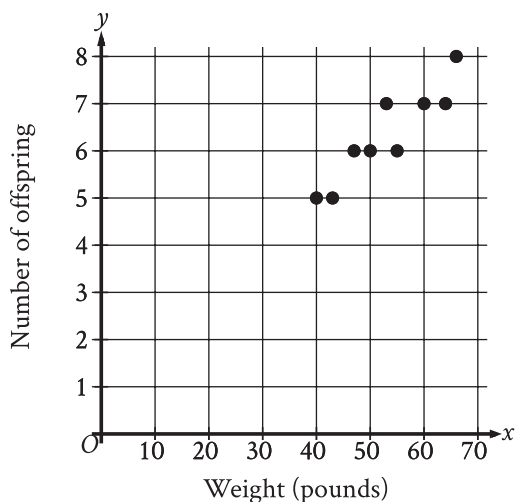
**For multiple-choice questions**, solve each problem, choose the correct answer from the choices provided, and then circle your answer in this book. Circle only one answer for each question. If you change your mind, completely erase the circle. You will not get credit for questions with more than one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

**For student-produced response questions**, solve each problem and write your answer next to or under the question in the test book as described below.

- Once you've written your answer, circle it clearly. You will not receive credit for anything written outside the circle, or for any questions with more than one circled answer.
- If you find **more than one correct answer**, write and circle only one answer.
- Your answer can be up to 5 characters for a **positive** answer and up to 6 characters (including the negative sign) for a **negative** answer, but no more.
- If your answer is a **fraction** that is too long (over 5 characters for positive, 6 characters for negative), write the decimal equivalent.
- If your answer is a **decimal** that is too long (over 5 characters for positive, 6 characters for negative), truncate it or round at the fourth digit.
- If your answer is a **mixed number** (such as  $3\frac{1}{2}$ ), write it as an improper fraction ( $\frac{7}{2}$ ) or its decimal equivalent (3.5).
- Don't include **symbols** such as a percent sign, comma, or dollar sign in your circled answer.

1

The scatterplot shows the relationship between the weight, in pounds, of each of 9 female gray wolves on April 30 and the number of offspring each gray wolf produced.



How many offspring did the 50-pound gray wolf produce?

- A) 8
- B) 7
- C) 6
- D) 5

2

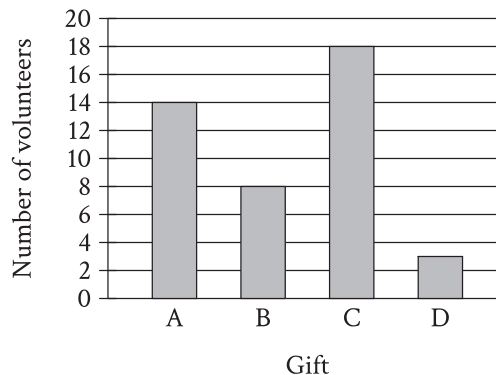
$$y = 4$$

$$x = y + 6$$

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

- A) 10
- B) 6
- C) 4
- D) 2

3



In April, there were 43 volunteers in a cleanup project. Each volunteer was asked to choose a small gift labeled A, B, C, or D. The bar graph shows the number of volunteers who chose each gift. How many volunteers chose gift C?

- A) 3
- B) 8
- C) 14
- D) 18

4

–13, 4, 23

A data set of three numbers is shown. If a number from this data set is selected at random, what is the probability of selecting a negative number?

- A) 0
- B)  $\frac{1}{3}$
- C)  $\frac{2}{3}$
- D) 1



5

A line in the  $xy$ -plane has a slope of  $-\frac{1}{2}$  and passes through the point  $(0, 3)$ . Which equation represents this line?

- A)  $y = -\frac{1}{2}x - 3$   
 B)  $y = -\frac{1}{2}x + 3$   
 C)  $y = \frac{1}{2}x - 3$   
 D)  $y = \frac{1}{2}x + 3$

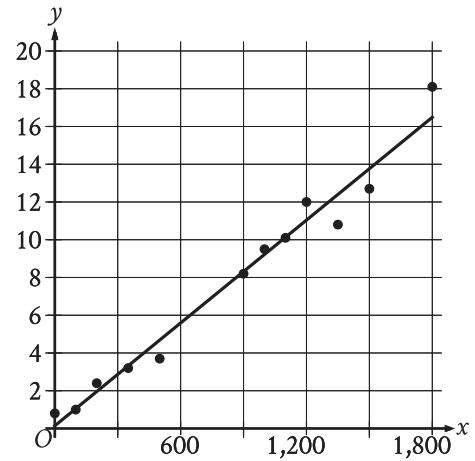
6

A product costs 11.00 dollars per pound. What is the cost, in dollars, for 6 pounds of the product?

7

The equation  $46 = 2x + 2y$  gives the perimeter of a rectangular rug that has length  $x$ , in feet, and width  $y$ , in feet. The width of the rug is 8 feet. What is the length, in feet, of the rug?

8



Twelve data points are shown in the scatterplot. A line of best fit for the data is also shown. At  $x = 1,200$ , which of the following is closest to the  $y$ -value predicted by the line of best fit?

- A) 16  
 B) 14  
 C) 11  
 D) 6

9

Which expression is equivalent to  $(8yz)(y)(7z)$ ?

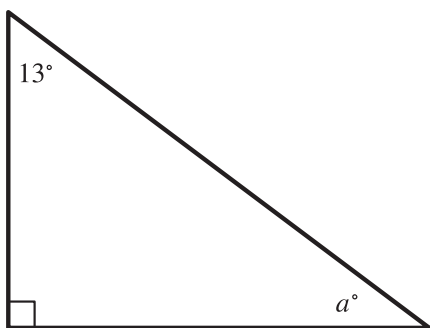
- A)  $56y^2z^2$   
 B)  $56y^2z$   
 C)  $56yz$   
 D)  $16yz$

10

A food truck buys forks for \$0.04 each and plates for \$0.48 each. The total cost of  $x$  forks and  $y$  plates is \$661.76. Which equation represents this situation?

- A)  $0.48x - 0.04y = 661.76$
- B)  $0.04x - 0.48y = 661.76$
- C)  $0.48x + 0.04y = 661.76$
- D)  $0.04x + 0.48y = 661.76$

11



Note: Figure not drawn to scale.

In the right triangle shown, what is the value of  $a$  ?

- A) 13
- B) 77
- C) 90
- D) 103

12

Gabriella deposits \$35 in a savings account at the end of each week. At the beginning of the 1st week of a year there was \$600 in that savings account. How much money, in dollars, will be in the account at the end of the 4th week of that year?

- A) 460
- B) 635
- C) 639
- D) 740

13

$$x^2 = (22)(22)$$

What is the positive solution to the given equation?

14

The ratio 140 to  $m$  is equivalent to the ratio 4 to 28. What is the value of  $m$  ?

15

If  $3x - 27 = 24$ , what is the value of  $x - 9$  ?

- A) 1
- B) 8
- C) 24
- D) 35

16

For the linear function  $f$ ,  $f(0) = 17$  and  $f(1) = 17$ . Which equation defines  $f$ ?

- A)  $f(x) = \frac{1}{17}$
- B)  $f(x) = 1$
- C)  $f(x) = 17$
- D)  $f(x) = 34$

17

The function  $f(x) = 55.20 - 0.16x$  gives the estimated surface water temperature  $f(x)$ , in degrees Celsius, of a body of water on the  $x$ th day of the year, where  $220 \leq x \leq 360$ . Based on the model, what is the estimated surface water temperature, in degrees Celsius, of this body of water on the 326th day of the year?

- A) 55.20
- B) 3.04
- C) -0.16
- D) -52.16

18

$$y = -\frac{1}{5}x$$
$$y = \frac{1}{7}x$$

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

- A) -5
- B) 0
- C) 2
- D) 7

19

A sample of a certain isotope takes 29 years to decay to half its original mass. The function  $s(t) = 184(0.5)^{\frac{t}{29}}$  gives the approximate mass of this isotope, in grams, that remains  $t$  years after a 184-gram sample starts to decay. Which statement is the best interpretation of  $s(87) = 23$  in this context?

- A) Approximately 23 grams of the sample remains 87 years after the sample starts to decay.
- B) The mass of the sample has decreased by approximately 23 grams 87 years after the sample starts to decay.
- C) The mass of the sample has decreased by approximately 87 grams 23 years after the sample starts to decay.
- D) Approximately 87 grams of the sample remains 23 years after the sample starts to decay.

20

How many fluid ounces are equivalent to 76 quarts?  
(8 fluid ounces = 1 cup and 4 cups = 1 quart)

21

A piece of wire with a length of 32 inches is cut into two parts. One part has a length of  $x$  inches, and the other part has a length of  $y$  inches. The value of  $x$  is 4 more than 3 times the value of  $y$ . What is the value of  $x$ ?

22

The table gives the perimeters of similar triangles  $TUV$  and  $XYZ$ , where  $\overline{TU}$  corresponds to  $\overline{XY}$ . The length of  $\overline{TU}$  is 18.

	Perimeter
Triangle $TUV$	37
Triangle $XYZ$	333

What is the length of  $\overline{XY}$ ?

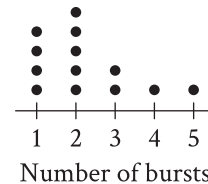
- A) 2
- B) 18
- C) 55
- D) 162

23

A sphere has a radius of  $\frac{17}{5}$  feet. What is the volume, in cubic feet, of the sphere?

- A)  $\frac{5\pi}{17}$
- B)  $\frac{68\pi}{15}$
- C)  $\frac{32\pi}{5}$
- D)  $\frac{19,652\pi}{375}$

24



The dot plot represents a data set of the number of bursts for 13 eruptions of a steam vent. If an additional eruption with 11 bursts is added to this data set to create a new data set of 14 eruptions, which of the following measures will be greater for the new data set than for the original data set?

- I. The median number of bursts
  - II. The mean number of bursts
- A) I and II
  - B) I only
  - C) II only
  - D) Neither I nor II

25

A factory makes 9-inch, 7-inch, and 4-inch concrete screws. During a certain day, the number of 9-inch concrete screws that the factory makes is 5 times the number  $n$  of 7-inch concrete screws, and the number of 4-inch concrete screws is 22. During this day, the factory makes 100 concrete screws total. Which equation represents this situation?

- A)  $9(5n) + 7n + 4(22) = 100$
- B)  $9n + 7n + 4n = 100$
- C)  $5n + 22 = 100$
- D)  $6n + 22 = 100$

26

The number  $a$  is 190% greater than the number  $b$ . The number  $b$  is 80% less than 24. What is the value of  $a$  ?

- A) 9.12
- B) 13.92
- C) 26.40
- D) 36.48

27

A right square prism has a height of 14 units. The volume of the prism is 2,016 cubic units. What is the length, in units, of an edge of the base?

**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.**

**No Test Material On This Page**

**No Test Material On This Page**

# PSAT™ 8/9

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## GENERAL DIRECTIONS

- You may work on only one module at a time.
- If you finish a module before time is called, check your work on that module only. You may NOT turn to any other module.

## TIMING

Reading and Writing, Module 1: 39 minutes

Reading and Writing, Module 2: 39 minutes

*10-minute break*

Math, Module 1: 43 minutes

Math, Module 2: 43 minutes

The above are standard times. If you are approved for accommodations involving additional time, you should give yourself that time when you practice.

## MARKING YOUR ANSWERS

- Be sure to answer your questions properly in this book.
- Circle only one answer to 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.

## USING YOUR TEST BOOK

- You may use the test book for scratch work.
- You may not fold or remove pages or portions of a page from this book, or take the book from the testing room.