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PSAT™ 8/9

6URL01

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

Bioluminescent beetles called fireflies may seem to create flashes of light randomly, but each species of firefly actually has its own special series of repeated flashes and pauses. These unique _____ allow fireflies of the same species to find each other.

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

A) quantities
B) decorations
C) patterns
D) agreements

2

As an architect in Los Angeles in the 1950s, Helen Liu Fong became known for avoiding _____ designs in her buildings. Instead of using standard shapes and colors, she typically explored innovative forms and daring hues.

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

A) creative
B) bold
C) traditional
D) understandable

3

The printing of Virginia Woolf's novels featured a creative _____ between Woolf and her sister Vanessa Bell: a talented painter, Bell worked closely with Woolf to create original cover art for most of the novels.

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

A) rebellion
B) partnership
C) discovery
D) disagreement

4

A brief book review cannot fully convey the _____ of Olga Tokarczuk's novel *The Books of Jacob*, with its enormous cast of characters, its complicated, wandering plot, and its page numbers that count backward (beginning at 965 and ending at 1).

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

A) accuracy
B) inactivity
C) complexity
D) restraint

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CONTINUE

5

Sumerian civilization (which lasted from around 3300 to 2000 BCE) _____ many concepts that persist into present-day civilizations: for example, the first description of the seven-day week appears in the Sumerian *Epic of Gilgamesh*.

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

A) transformed
B) introduced
C) inherited
D) overlooked

6

The following text is adapted from Louisa May Alcott's 1869 novel *An Old-Fashioned Girl*. Polly, a teenager, is visiting her friend Fanny.

> Fanny's friends did not interest Polly much; she was rather afraid of them [because] they seemed so much older and wiser than herself, even those younger in years. They talked about things of which she knew nothing and when Fanny tried to explain, she didn't find them interesting; indeed, some of them rather shocked and puzzled her.

Which choice best states the main purpose of the text?

A) To portray Polly's reaction to Fanny's friends
B) To identify the topics Polly talks about with Fanny's friends
C) To explain how Fanny met some of her friends
D) To illustrate how Fanny's friends feel about Polly

7

In 1801, a Blackfoot chief named Ac Ko Mok Ki drew a finely detailed map of the Upper Missouri region. This work demonstrates a vast amount of topographic knowledge, as the map features specific names of mountains and rivers, as well as the first-known sketch of the drainage network of the Missouri River. The map is especially notable because Ac Ko Mok Ki also included details about the numerous tribes that lived in the area.

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

A) It emphasizes Ac Ko Mok Ki's desire to represent other tribes on the map.
B) It explains how Ac Ko Mok Ki developed an interest in mapmaking.
C) It identifies some reasons why the map is impressive.
D) It details how the map was used for hunting and trading purposes.

8

Yawn contagion occurs when one individual yawns in response to another's yawn. Studies of this behavior in primates have focused on populations in captivity, but biologist Elisabetta Palagi and her colleagues have shown that it can occur in wild primate populations as well. In their study, which focused on a wild population of gelada monkeys (*Theropithecus gelada*) in Ethiopia, the researchers further reported that yawn contagion most commonly occurred in males and across different social groups instead of within a single social group.

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

A) It defines a phenomenon that is discussed in the text.
B) It introduces a problem that is examined in the text.
C) It makes a claim that is challenged in the text.
D) It presents a hypothesis that is evaluated in the text.

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CONTINUE

9

The following text is adapted from Paul Laurence Dunbar's 1902 novel *The Sport of the Gods*. Joe and some of his family members have recently moved to New York City.

> [Joe] was wild with enthusiasm and with a desire to be a part of all that the metropolis meant. In the evening he saw the young fellows passing by dressed in their spruce clothes, and he wondered with a sort of envy where they could be going. Back home there had been no place much worth going to, except church and one or two people's houses.

Which choice best states the main purpose of the text?

A) It illustrates a character's reaction to a new environment.

B) It explains why a character has traveled to a city.

C) It compares a character's thoughts about an event at two different times of day.

D) It presents a character feeling regret over leaving home.

10

The painter María Izquierdo played an important role in the development of twentieth-century Mexican art, but her work has never been well-known in the United States except among art historians. One reason for Izquierdo's relative obscurity is the enormous popularity of some of her peers. In particular, the painters Frida Kahlo and Diego Rivera have so captivated the interest of US audiences that Izquierdo and other Mexican artists from the period often get overlooked, despite the high quality of their work.

Which choice best states the main idea of the text?

A) Izquierdo's work is not as well-known in the United States as it should be because Kahlo and Rivera draw so much of the public's attention.

B) During Izquierdo's lifetime, her paintings were displayed in galleries in the United States much more frequently than paintings by Kahlo and Rivera were.

C) Izquierdo painted some of the same subjects that Kahlo and Rivera painted but used different techniques than they used.

D) Few of Izquierdo's works are in galleries today because she produced only a small number of paintings.

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CONTINUE

11

Moons of Dwarf Planets

Dwarf planet name	Number of moons	Name of moons
Haumea	2	Hi'iaka, Namaka
Ceres	0	N/A
Makemake	1	MK 2
Eris	1	Dysnomia
Pluto	5	Charon, Nix, Kerberos, Styx, Hydra

Like Earth, some dwarf planets in the solar system have exactly one moon. Two examples of such dwarf planets are _____

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

A) Eris and Makemake.

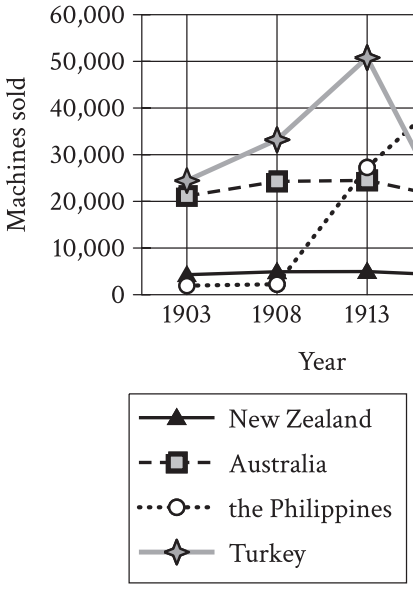
B) Haumea and Eris.

C) Pluto and Haumea.

D) Makemake and Ceres.

12

Singer Sewing Machine Sales in Four Countries, 1903–1918



By the early 1900s, the Singer Corporation, a US sewing machine manufacturer founded in 1851, began to see rapidly increasing sales abroad, particularly in Russia, Germany, and the United Kingdom. These markets were responsible for the bulk of Singer's overseas sales, but demand for the company's machines in other countries also grew significantly in the early twentieth century. For instance, sales of their sewing machines in _____

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

A) the Philippines increased dramatically from 1908 to 1918.

B) New Zealand were largely consistent from 1903 to 1918.

C) Australia increased steadily from 1903 to 1918.

D) Turkey declined substantially from 1913 to 1918.

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CONTINUE

13

Results of Footprint Analysis for Two Sets of Theropod Tracks

Tracks	Estimated footprint length (centimeters)	Average stride length (meters)	Estimated mean speed (meters per second)
La Torre 6A	32.8	5.23	6.5–10.3
La Torre 6B	28.9	5.57	8.8–12.4

The table shows data from paleontologist Angélica Torices and colleagues' 2021 study of two sets of dinosaur tracks preserved in a fossilized lake bed in Spain. The tracks, referred to as La Torre 6A and La Torre 6B, were left by two individual theropods (dinosaurs that walked on two legs). The team's findings suggest that of the two theropods, the one that left the La Torre 6B tracks had a higher maximum mean speed, _____

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

A) a longer footprint, and a longer average stride.

B) a longer footprint, and a shorter average stride.

C) a shorter footprint, and a longer average stride.

D) a shorter footprint, and a shorter average stride.

14

In 1967 the US Congress created the Corporation for Public Broadcasting, which in turn created National Public Radio (NPR). NPR began producing and distributing high-quality news and cultural programming to affiliate stations across the United States in 1971. In a research paper, a student claims that the Corporation for Public Broadcasting and NPR were inspired by the British Broadcasting System (BBC), which had been established in the 1920s.

Which quotation from a work by a historian would be the most effective evidence for the student to include in support of this claim?

A) "Although the BBC had begun as a private corporation, politicians successfully argued to make it a public company because they believed a public broadcaster could help build national unity in the aftermath of World War I."

B) "For many decades, the BBC had no competition since it held Britain's only broadcasting license, whereas in the United States, the Corporation for Public Broadcasting launched NPR in a broadcasting market already filled with competitors."

C) "Congress's embrace of publicly funded broadcasting reflected a common belief among US politicians that the role of government was not only to ensure people's safety and liberty but also to enrich people's lives in other ways."

D) "The goal of the BBC was to support British democracy by promoting an informed citizenry, and US legislators believed that ensuring access to high-quality programming could do the same for democracy in the United States."

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CONTINUE

15

"Odalie" is an 1899 short story by Alice Dunbar-Nelson. In the story, a young woman named Odalie attends the annual Mardi Gras carnival in New Orleans, where she lives with her guardian Tante Louise. Dunbar-Nelson portrays Odalie as eager to escape the monotony of her everyday life: _____

Which quotation from "Odalie" most effectively illustrates the claim?

A) "Mardi Gras was a tiresome day, after all, she sighed, and Tante Louise agreed with her for once."

B) "In the old French house on Royal Street, with its quaint windows and Spanish courtyard green and cool, and made musical by the plashing of the fountain and the trill of caged birds, lived Odalie in convent-like seclusion."

C) "When one is shut up in a great French house with a grim sleepy tante and no companions of one's own age, life becomes a dull thing, and one is ready for any new sensation."

D) "It was Mardi Gras day at last, and early through her window Odalie could hear the jingle of folly bells on the [participants'] costumes, the tinkle of music, and the echoing strains of songs."

16

Five of the Responses to Survey about Actions to Conserve Energy

Action	Action category	Percentage of respondents selecting action (%)
Use efficient cars/hybrids	efficiency	2.8
Change thermostat setting	curtailment	6.3
Use bike or public transportation instead of car	curtailment	12.9
Use efficient light bulbs	efficiency	3.6
Turn off lights	curtailment	19.6

In a survey of public perceptions of energy use, researcher Shahzeen Attari and her team asked respondents to name the most effective action ordinary people can take to conserve energy. The team categorized each action as either an efficiency or a curtailment and found that respondents tended to name curtailments more often than they did efficiencies. For example, 19.6% of respondents stated that the most effective way to conserve energy is to turn off the lights, while only _____

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

A) 6.3% of respondents said it was most effective to use efficient cars or hybrids.

B) 2.8% of respondents said it was most effective to change the thermostat setting.

C) 12.9% of respondents said it was most effective to use a bike or public transportation.

D) 3.6% of respondents said it was most effective to use efficient light bulbs.

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CONTINUE

17

An archaeological team led by Piotr Bieliński and Sultan al-Bakri found remnants of a 4,000-year-old Bronze Age board game at a site in Oman. Little is left of the game except a stone board, which is carved with a grid and has places to hold game pieces. Some scholars claim that the game was largely played by traders.

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

A) Other examples of the game dating to the same period have been found in the remains of several homes in the region, including in one home that may have belonged to a trader.

B) Similar games have been found in other sites dating to the same period that were connected to the site in Oman via trade routes.

C) The other known examples of the game dating to the same period have been found along routes that seem to have been used primarily by traders at the time.

D) Remnants of other goods have been found at the site in Oman that probably also reached the location through trade.

18

Swahili Speakers in Three African Countries

Country	Approximate number of speakers (in millions)	Estimated % of population
Democratic Republic of the Congo	22	25
Kenya	55	100
Tanzania	61	100

Swahili is estimated to be the first language of up to 15 million people worldwide. It's also an officially recognized language in Tanzania, Kenya, and the Democratic Republic of the Congo, which means these countries use Swahili in government documents and proceedings. But even in countries where almost everyone speaks Swahili, for many it isn't their first language but is instead their second, third, or even fourth language.

Which choice most effectively uses data from the table to support the underlined claim?

A) Tanzania has approximately 61 million Swahili speakers, which is much more than the estimated total number of people worldwide for whom Swahili is their first language.

B) Tanzania is estimated to have at most 15 million Swahili speakers, while the country's total population is approximately 61 million people.

C) Approximately 100 percent of the people who speak Swahili as their first language live in Kenya, which has a total population of approximately 55 million people.

D) Approximately 100 percent of Kenya's population speaks Swahili, while only about 25 percent of the Democratic Republic of the Congo's population speaks Swahili.

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CONTINUE

19

Obsidian is a kind of volcanic glass formed when lava cools so quickly that the atoms inside it cannot arrange themselves in a crystalline structure. You _____ more about obsidian's structure, which is classified as amorphous, in a later chapter.

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

A) had learned
B) had been learning
C) will learn
D) have learned

20

With its towering, six-spired exterior of granitelike quartz monzonite, the Salt Lake Temple is one of the most instantly recognizable structures in the state of Utah. However, many people do not know that _____ built over the course of forty years, with construction beginning in 1853 and ending in 1893.

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

A) it was
B) one was
C) they were
D) both were

21

Human-made (synthetic) fibers used in clothes and many other consumer products are more durable than most natural plant _____ the manufacture of synthetic fibers requires toxic chemical solvents that can pollute air and water.

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

A) fibers,
B) fibers but
C) fibers
D) fibers, but

22

The fine, powdery substance that covers the Moon's surface is called regolith. Because regolith is both readily available and high in oxygen _____ scientists have wondered whether it could be used as a potential source of oxygen for future lunar settlements.

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

A) content and
B) content,
C) content
D) content, and

23

Each year in the fall, when the weather starts to cool in the northern hemisphere, millions of North American monarch butterflies journey south. Searching for food and warmer habitats, they _____ thousands of miles—from as far north as Canada all the way down to Mexico—on this annual migration.

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

A) flew
B) were flying
C) had flown
D) fly

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CONTINUE

24

Objects ranging from the Kikkoman soy sauce bottle to the Yamaha VMAX motorcycle to the Komachi bullet train _____ designed by twentieth-century industrial designer Kenji Ekuan.

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

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

25

"Praise Song for the Day," Elizabeth Alexander's 2009 inaugural poem, asserts that "We cross dirt roads and highways…to see what's on the other side." Alexander's use of "we" _____ Americans' collective efforts and shared desire to seek new opportunity.

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

A) evokes
B) are evoking
C) have evoked
D) evoke

26

Author Madeline L'Engle, _____ to create a suspenseful tone that draws the reader in, begins her novel *A Wrinkle in Time* with descriptions of "wraithlike shadows" and "the frenzied lashing of the wind."

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

A) looked
B) looks
C) is looking
D) looking

27

In 1955, Indian Bengali filmmaker Satyajit Ray released his first movie, *Pather* _____ quiet black-and-white drama about a family in rural India, Ray's film was quite different from the loud, colorful action-romance movies that were popular at the time.

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

A) *Panchali* a
B) *Panchali*, which was a
C) *Panchali*, a
D) *Panchali*. A

28

A recent study tracked the number of bee species present in twenty-seven New York apple orchards over a ten-year period. _____ found that when wild growth near an orchard was cleared, the number of different bee species visiting the orchard decreased.

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

A) Entomologist Heather Grab:
B) Entomologist, Heather Grab,
C) Entomologist Heather Grab
D) Entomologist Heather Grab,

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CONTINUE

29

Tyrian purple was a highly prized dye among the Phoenicians (an ancient civilization located in present-day Lebanon). The Phoenicians were famous for using this natural dye to color their clothes a distinctive purple. _____ the name "Phoenicia" itself, some historians claim, may have originally meant "land of purple."

Which choice completes the text with the most logical transition?

A) In fact,
B) Regardless,
C) Lastly,
D) On the contrary,

30

In Gothic architecture, flying buttresses are large arches that help support a building's exterior walls. Before the Gothic era, cathedrals' heavy ceilings had to be supported by thick, short walls, but the invention of flying buttresses eliminated this need. _____ Gothic cathedrals could be built with thinner, higher walls.

Which choice completes the text with the most logical transition?

A) Similarly,
B) For instance,
C) Nevertheless,
D) As a result,

31

In 1873, Spanish scientist Santiago Ramón y Cajal observed that brain fibers have distinct boundaries with clear end points, a finding that went against earlier assumptions about the brain. _____ scientists had assumed that the brain was a continuous web of fused fibers, not a vast network of distinct, individual cells.

Which choice completes the text with the most logical transition?

A) However,
B) Previously,
C) As a result,
D) Likewise,

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CONTINUE

32

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

- The Sasanian Empire lasted about 400 years (AD 224 to AD 651).
- The Sasanians controlled an area spanning 1.4 million square miles.
- This area included present-day Iran and Iraq.
- The empire's capital was the ancient city of Ctesiphon.
- Ctesiphon was located near present-day Baghdad, Iraq.

The student wants to specify the location of Ctesiphon. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) The Sasanian Empire began in AD 224 and ended in AD 651.

B) The capital of the Sasanian Empire, which spanned 1.4 million square miles, was Ctesiphon.

C) The Sasanians controlled an area of 1.4 million square miles, including present-day Iran and Iraq.

D) Ctesiphon, the capital of the Sasanian Empire, was located near present-day Baghdad, Iraq.

33

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

- In the art world, the term biennial traditionally refers to an art exhibition that takes place every two years in a single location.
- Such biennials are held in New York, Berlin, and Venice.
- In 2006, artists Ed Gomez and Luis Hernandez founded the unconventional MexiCali Biennial.
- The MexiCali Biennial hosts exhibitions in different venues on both sides of the US-Mexico border.
- The MexiCali Biennial has taken place on an uneven schedule, with exhibitions in 2006, 2009–10, 2013, and 2018–20.

The student wants to emphasize a difference between the MexiCali Biennial and traditional biennials. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) In 2006, artists Ed Gomez and Luis Hernandez founded the MexiCali Biennial, which has taken place in 2006, 2009–10, 2013, and 2018–20.

B) Unlike traditional biennials, the MexiCali Biennial hosts exhibitions in different venues on an uneven schedule.

C) The term biennial traditionally refers to an art exhibition that takes place every two years in a single location, not to exhibitions hosted at a variety of times and venues.

D) Biennial exhibitions have been held in New York, Berlin, and Venice but also on both sides of the US-Mexico border.

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.

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No Test Material On This 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 from Nella Larsen's 1928 novel *Quicksand*.

> The trees in their spring beauty sent through her restive mind a sharp thrill of pleasure. Seductive, charming, and beckoning as cities were, they had not this easy unhuman loveliness.

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

A) Demanding
B) Signaling
C) Inviting
D) Shifting

2

Physicist Joseph Weber performed _____ work in gravitational wave research in the 1960s and 1970s, conducting key experiments that scientists later used as the basis for their own investigations that led to the first verified detection of a gravitational wave in 2015.

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

A) foundational
B) supplementary
C) repetitive
D) ineffective

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CONTINUE

3

Sueño de Familia is an exhibition of drawings, paintings, and ceramics that explores the artistic heritage of US-based artist Yolanda González. The exhibition _____ five generations, featuring works by González's great-grandfather, grandmother, mother, and niece as well as González herself.

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

A) borrows
B) spans
C) judges
D) neglects

4

The following text is from Claude McKay's 1922 poem "Morning Joy." The speaker is looking out a window and observing a wold, or large area of land.

> At night the wide and level stretch of wold,
> Which at high noon had basked in quiet gold,
> Far as the eye could see was ghostly white;
> Dark was the night save for the snow's weird light.
>
> I drew the shades far down, crept into bed;
> Hearing the cold wind moaning overhead
> Through the sad pines, my soul, catching its pain,
> Went sorrowing with it across the plain.

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

A) Pulled
B) Drained
C) Inspired
D) Sketched

5

Some people have speculated that two helmets with attached horns discovered in Denmark in 1942 belonged to Vikings, but scholars have long been skeptical. Archaeologist Helle Vandkilde and colleagues recently provided radiocarbon dates for the helmets, and their findings _____ scholars' skepticism: the helmets date to the Nordic Bronze Age, centuries before the Vikings existed.

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

A) anticipate
B) inspect
C) reveal
D) justify

6

Streams and rivers carry soil and rocks from one location to another. But there is another way for these geological materials to move. Scientists call this process "aeolian transport." In aeolian transport, winds move small particles of soil or rock over potentially great distances. Geologist Melisa Diaz and her team studied dust in Antarctica to find out if it was moved by aeolian transport. They discovered that the dust matched geological material in Australia. Aeolian transport had carried it from one continent to another, across thousands of miles of open ocean.

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

A) It presents Melisa Diaz's remarks about difficulties that her team encountered.
B) It introduces a scientific term that is used in the discussion that follows.
C) It emphasizes the surprising nature of the findings that are presented.
D) It explains the difference between two kinds of geological material.

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CONTINUE

7

San Francisco is known for the colorful murals painted on many of its buildings. The densest collection of murals is found on Balmy Alley in the Mission District neighborhood. In the 1970s, Latina artists painted vivid scenes of community life on walls along this block. As the original murals have faded, later generations of artists have painted new ones over them. As a result, Balmy Alley has become a living showcase of San Francisco's artistic spirit, with its murals reflecting changes in the cultural life of the city.

Which choice best states the main purpose of the text?

A) To compare the Balmy Alley murals to other murals in San Francisco

B) To offer an overview of the history and importance of the Balmy Alley murals

C) To urge people to protect the murals of San Francisco from decay

D) To describe the rise of mural painting in San Francisco beginning in the 1970s

8

Industrial activity is often assumed to be a threat to wildlife, but that isn't always so. Consider the silver-studded blue butterfly (*Plebejus argus*): as forest growth has reduced grasslands in northern Germany, many of these butterflies have left meadow habitats and are now thriving in active limestone quarries. In a survey of multiple active quarries and patches of maintained grassland, an ecologist found silver-studded blue butterflies in 100% of the quarries but only 57% of the grassland patches. Moreover, butterfly populations in the quarries were four times larger than those in the meadows.

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

A) It challenges a common assumption about the species under investigation in the research referred to in the text.

B) It introduces discussion of a specific example that supports the general claim made in the previous sentence.

C) It suggests that a certain species should be included in additional studies like the one mentioned later in the text.

D) It provides a definition for an unfamiliar term that is central to the main argument in the text.

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CONTINUE

9

Text 1
Dominique Potvin and colleagues captured five Australian magpies (*Gymnorhina tibicen*) to test a new design for attaching tracking devices to birds. As the researchers fitted each magpie with a tracker attached by a small harness, they noticed some magpies without trackers pecking at another magpie's tracker until it broke off. The researchers suggest that this behavior could be evidence of magpies attempting to help another magpie without benefiting themselves.

Text 2
It can be tempting to think that animals are deliberately providing help when we see them removing trackers and other equipment from one another, especially when a species is known to exhibit other cooperative behaviors. At the same time, it can be difficult to exclude the possibility that individuals are simply interested in the equipment because of its novelty, curiously pawing or pecking at it until it detaches.

Based on the texts, how would the author of Text 2 most likely respond to the researchers' perspective in Text 1 on the behavior of the magpies without trackers?

A) That behavior might have been due to the novelty of the magpies' captive setting rather than to the novelty of the tracker.

B) That behavior likely indicates that the magpies were deliberately attempting to benefit themselves by obtaining the tracker.

C) That behavior may not be evidence of selflessness in *Gymnorhina tibicen* because not all the captured magpies demonstrated it.

D) That behavior might be adequately explained without suggesting that the magpies were attempting to assist the other magpie.

10

Philadelphia's Black Pearl Chamber Orchestra, founded by Jeri Lynne Johnson, performs classical music, from well-known compositions by Beethoven to contemporary works by Jessie Montgomery. For the orchestra's iConduct! program, Johnson invites community members to learn some basic elements of conducting and then experience conducting the Black Pearl orchestra themselves.

Which choice best states the main idea of the text?

A) The Black Pearl orchestra performs music from all over the world but mostly performs music composed by Philadelphians.

B) Johnson founded the Black Pearl orchestra to perform classical music by contemporary artist Jessie Montgomery.

C) The Black Pearl orchestra gives community members the chance to both listen to and participate in classical music performance.

D) Johnson has community members conduct an orchestra to demonstrate how difficult the task is.

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CONTINUE

11

The recovery of a 1,000-year-old Chinese shipwreck in the Java Sea near present-day Indonesia has yielded a treasure trove of artifacts, including thousands of small ceramic bowls. Using a portable X-ray fluorescence analyzer tool, Lisa Niziolek and her team were able to detect the chemical composition of these bowls without damaging them. By comparing the chemical signatures of the bowls with those of the materials still at old Chinese kiln sites, Niziolek and her team can pinpoint which Chinese kilns likely produced the ceramic bowls.

Which choice best states the main idea of the text?

A) Because of a new technology, researchers can locate and recover more shipwrecks than they could in the past.

B) Researchers have been able to identify the location of a number of Chinese kilns in operation 1,000 years ago.

C) With the help of a special tool, researchers have determined the likely origin of bowls recovered from a shipwreck.

D) Before the invention of portable X-ray fluorescence, researchers needed to take a small piece out of an artifact to analyze its components.

12

The following text is adapted from Guy de Maupassant's nineteenth-century short story "The Trip of Le Horla" (translated by Albert M. C. McMaster, A. E. Henderson, Mme. Quesada, et al.). The narrator is part of a group traveling in a hot-air balloon at night.

> The earth no longer seems to exist, it is buried in milky vapors that resemble a sea. We are now alone in space with the moon, which looks like another balloon travelling opposite us; and our balloon, which shines in the air, appears like another, larger moon, a world wandering in the sky amid the stars, through infinity. We no longer speak, think nor live; we float along through space in delicious inertia. The air which is bearing us up has made of us all beings which resemble itself, silent, joyous, irresponsible beings, peculiarly alert, although motionless.

Which choice best states the main idea of the text?

A) The narrator feels a growing sense of isolation even though his companions are nearby during the balloon ride.

B) The narrator and his companions are completely absorbed in the change in perspective they gain while riding in the balloon.

C) The narrator and his companions are troubled by the disorienting effects of the altitude while riding in the balloon.

D) The narrator is pleasantly surprised by his companions' unrestrained enthusiasm about the sensation of riding in the balloon.

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CONTINUE

13

Icebergs generally appear to be mostly white or blue, depending on how the ice reflects sunlight. Ice with air bubbles trapped in it looks white because much of the light reflects off the bubbles. Ice without air bubbles usually looks blue because the light travels deep into the ice and only a little of it is reflected. However, some icebergs in the sea around Antarctica appear to be green. One team of scientists hypothesized that this phenomenon is the result of yellow-tinted dissolved organic carbon in Antarctic waters mixing with blue ice to produce the color green.

Which finding, if true, would most directly weaken the team's hypothesis?

A) White ice doesn't change color when mixed with dissolved organic carbon due to the air bubbles in the ice.

B) Dissolved organic carbon has a stronger yellow color in Antarctic waters than it does in other places.

C) Blue icebergs and green icebergs are rarely found near each other.

D) Blue icebergs and green icebergs contain similarly small traces of dissolved organic carbon.

14

To create the poems in her 2017 collection *One Last Word*, poet Nikki Grimes used a writing method called the golden shovel. This method often involves choosing a line from an existing poem and then using each word from that line as the last word of each line in a new poem. Grimes wanted the poems in *One Last Word* to honor important Black poets of the past, so she chose lines by poets such as Langston Hughes and Georgia Douglas Johnson. Writing in this way can be challenging and might seem as though it would produce awkward poems. However, reviewers praised *One Last Word* as a beautiful and powerful tribute to the poets who inspired it. This reaction suggests that _____

Which choice most logically completes the text?

A) most reviewers didn't understand Grimes's goal for *One Last Word*.

B) Grimes successfully used the golden shovel method to achieve her goal for *One Last Word*.

C) Langston Hughes and Georgia Douglas Johnson are two of Grimes's favorite poets.

D) Grimes inspired many other writers to create poems using the golden shovel method.

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CONTINUE

15

The Indus River valley civilization flourished in South Asia from 3300 BCE to 1300 BCE. Many examples of the civilization's writing system exist, but researchers haven't yet deciphered it or identified which ancient language it represents. Nevertheless, archaeologists have found historical artifacts, such as clay figures and jewelry, that provide information about the civilization's customs and how its communities were organized. The archaeologists' findings therefore suggest that _____

Which choice most logically completes the text?

A) investigating an ancient civilization is easier without knowledge of the civilization's language.

B) knowing an ancient civilization's language isn't necessary in order to learn details about the civilization.

C) archaeological research should focus on finding additional artifacts rather than deciphering ancient languages.

D) examining the civilization's historical artifacts has resolved the debate about this civilization's language.

16

Ana Castillo's 1986 novel *The Mixquiahuala Letters* is a story told entirely through expressive letters from the narrator to her friend—letters that Castillo suggests could be read in several different orders. As they began reading it in class, some students remarked that they found the novel's letter format daunting and its treatment of gender relations old-fashioned. The professor, however, pointed out that the novel is written in modern-sounding language and addresses issues that still matter today, suggesting that *The Mixquiahuala Letters* _____

Which choice most logically completes the text?

A) has more to say about gender relations than other novels from the same period.

B) is more relevant to contemporary audiences than it may seem at first.

C) is easier to read than many contemporary novels that focus on friendship.

D) is best understood after multiple readings in different orders.

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CONTINUE

17

By running computer simulations of the development of our solar system, André Izidoro, Rajdeep Dasgupta, and colleagues concluded that the Sun may have been surrounded by three giant dust rings before the planets started to form. The researchers suggest that the materials in the innermost ring became the four planets closest to the Sun, the materials in the middle ring produced the rest of the planets, and the materials in the outermost ring created the asteroids and other small bodies in the region beyond Neptune. In one simulation, the researchers delayed the initial formation of the middle ring, causing oversized super-Earths to begin developing from the innermost ring. The researchers therefore hypothesize that _____

Which choice most logically completes the text?

A) the middle ring formed earlier in the solar system's development than the initial simulations suggested.

B) the timing of the initial formation of the middle ring played an important role in determining the eventual size of Earth.

C) if the formation of the outermost ring had occurred earlier in a simulation, all the planets would have become super-Earths.

D) the innermost ring actually formed into all the planets in our solar system, not just the four closest to the Sun.

18

Archaeologists and historians used to believe that the Maya civilization during its Classic period (roughly 250–900) lacked agricultural marketplaces. One reason for this belief was that these scholars misunderstood the ecology of the regions the Maya inhabited. Marketplaces typically emerge because different individuals or groups want to trade resources they control for resources they don't control. Scholars seriously underestimated the ecological diversity of the Maya landscape and thus assumed that _____

Which choice most logically completes the text?

A) marketplaces likely would not have attracted many traders from outside the regions controlled by the Maya.

B) farming practices would have been largely the same throughout Maya lands even if the crops people produced varied significantly.

C) marketplaces would not have enabled Maya people to acquire many products different from those they already produced.

D) farmers would trade agricultural products only if they had already produced enough to meet their own needs.

19

In 1976, the Inuit rock group Sikumiut recorded the album *People of the Ice*. Though only their first record, it shows a band already skilled at the difficult task of making music that sounds easy and fun. On songs like "Utirumavunga," Lucassie Koperqualuk's guitar riffs effortlessly _____ Charlie Adams's delightfully catchy vocal melodies.

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

A) blend, with

B) blend. With

C) blend; with

D) blend with

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CONTINUE

20

If you try on one of artist Nick Cave's signature Soundsuits, you can expect to swish, rustle, or clang every time you move. Cave makes his suits out of found objects, everything from ceramic birds to broken record players. He carefully considers the sound an object makes before using _____ in a suit.

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

A) this
B) that
C) these
D) it

21

The alga species *Chlorella vulgaris* is very efficient at making oxygen. For this reason, scientists are currently exploring ways to use this species in space. *C. vulgaris* might be used, for example, to build future biological air exchange systems that _____ oxygen for astronauts.

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

A) are producing
B) produced
C) produce
D) have produced

22

Farouk El-Baz, a geologist and space scientist, _____ part of the team that selected the lunar landing sites for the Apollo program during the 1960s and 1970s.

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

A) are
B) was
C) have been
D) were

23

A pioneer in the field of taphonomy (the study of how organic remains become fossils), _____ may be just as prevalent in the fossil record as those of thick-shelled organisms.

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

A) fossils of thin-shelled organisms, Anna Behrensmeyer demonstrated in a 2005 analysis,
B) Anna Behrensmeyer demonstrated in a 2005 analysis that fossils of thin-shelled organisms
C) it was demonstrated in a 2005 analysis by Anna Behrensmeyer that fossils of thin-shelled organisms
D) a 2005 analysis—by Anna Behrensmeyer—demonstrated that fossils of thin-shelled organisms

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CONTINUE

24

In 2018, the innovative works of Congolese sculptor and architect Bodys Isek _____ were featured in *City Dreams*, a solo exhibition at New York's Museum of Modern Art.

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

A) Kingelez;
B) Kingelez,
C) Kingelez
D) Kingelez:

25

The poem *Beowulf* begins with the word "hwæt," which is an Old English _____ as "hark!" or "listen!" in some versions, the word was playfully rendered as "bro!" by Maria Dahvana Headley in her 2020 translation of the poem.

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

A) exclamation, translated
B) exclamation and translated
C) exclamation translated
D) exclamation. Translated

26

In June, female loggerhead sea turtles will swim back to the sandy beaches where they were born to lay eggs of their own. First, the turtle will dig her nest in the sand. _____ she will lay up to 100 eggs in the nest. Finally, she will cover it all with sand, before returning to the ocean.

Which choice completes the text with the most logical transition?

A) By contrast,
B) Similarly,
C) Next,
D) For example,

27

As biologist Terrie Williams has documented, deep dives present a challenge for seals and other marine mammals. A seal must exert enough energy to propel itself hundreds of meters downward, while keeping its heart rate low enough that it doesn't run out of oxygen while underwater. _____ a seal moves its flippers as little as possible on a deep dive, gliding to conserve energy.

Which choice completes the text with the most logical transition?

A) In the first place,
B) On the other hand,
C) For this reason,
D) In comparison,

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CONTINUE

28

As a young historian in the 1950s, Alixa Naff began interviewing fellow Arab American immigrants about their experiences straddling two cultures. Over the next few decades, Naff conducted more than 450 such interviews, also known as oral histories. _____ she collected photographs and other artifacts that represented her subjects' experiences.

Which choice completes the text with the most logical transition?

A) In other words,

B) On the contrary,

C) In addition,

D) Today,

29

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

- The tundra is a type of environment characterized by especially harsh winter conditions.
- Winter temperatures in the tundra average a frigid –30 degrees Fahrenheit.
- Animals that have adapted to these conditions can survive tundra winters.
- During the tundra's short growing season, average temperatures can reach a relatively mild 54 degrees Fahrenheit.
- Around 1,700 different kinds of plants are able to grow in the tundra.

The student wants to emphasize how harsh the conditions can be in the tundra. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) Winters in the tundra are especially harsh, with temperatures averaging a frigid –30 degrees Fahrenheit.

B) Animals that have adapted to harsh winter conditions can survive tundra winters.

C) There are around 1,700 different kinds of plants that can live in the tundra, where average temperatures can reach a mild 54 degrees Fahrenheit.

D) Along with animals that have adapted to the tundra's conditions, around 1,700 different kinds of plants can live in the tundra.

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CONTINUE

30

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

- Minnesota defines a lake as an inland body of water of at least 10 acres.
- Wisconsin's definition of a lake doesn't take size into account.
- By its own definition, Wisconsin has over 15,000 lakes, many smaller than 10 acres.
- By Minnesota's definition, Wisconsin has only about 6,000 lakes.

The student wants to contrast Minnesota's definition of a lake with Wisconsin's. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) Wisconsin, which doesn't take size into account in defining a lake, claims that it has over 15,000 lakes.

B) Because its definition of a lake is different from Minnesota's, it is unclear how many lakes Wisconsin really has.

C) According to Minnesota's definition of a lake—an inland body of water of at least 10 acres—Wisconsin has about 6,000 lakes.

D) Minnesota's definition of a lake—an inland body of water of at least 10 acres—is more restrictive than Wisconsin's, which doesn't take size into account.

31

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

- Just like states have state flags, some cities have city flags.
- Over one hundred US cities have redesigned their flags since 2015.
- The city of Pocatello, Idaho, redesigned its flag after it was named the most poorly designed flag in North America.
- Pocatello's new flag better represents the city's mountainous geography and civic priorities.
- Residents consider the new flag to be a meaningful symbol of civic pride.

The student wants to make and support a generalization about the effect of redesigning a city flag. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) Over one hundred US cities have redesigned their flags, including Pocatello, whose flag had been named the most poorly designed flag in North America.

B) Pocatello is just one of over one hundred US cities that have redesigned their flags.

C) After it was named the most poorly designed flag in North America, the flag of Pocatello was redesigned to better represent the city's geography and civic priorities.

D) Redesigning a poorly designed city flag can create a meaningful symbol of civic pride, as was the case when Pocatello redesigned its original flag to better represent its geography and civic priorities.

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CONTINUE

32

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

- Allan Houser was a Chiricahua Warm Springs Apache sculptor, illustrator, and painter.
- Many of his sculptures featured Native American figures.
- He depicted this subject matter using abstract, modernist forms, developing a distinctive style that influenced many other artists.
- His well-known sculpture *Sacred Rain Arrow* was pictured on the State of Oklahoma license plate.

The student wants to describe the distinctive style of Houser's sculptures. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) A sculptor, illustrator, and painter, Houser developed a distinctive style for portraying Native American figures.

B) Houser's sculptures employ abstract, modernist forms to depict Native American figures.

C) Many other artists have been influenced by the style of Houser's sculptures.

D) The sculpture *Sacred Rain Arrow* is a well-known example of Houser's style.

33

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

- Architect Julian Abele studied Gregorian and neo-Gothic architecture in Europe.
- Abele worked for an architecture firm that was hired in 1924 to design buildings for Duke University's new campus.
- Most of the buildings on Duke's campus were designed in the Gregorian or neo-Gothic architectural styles.
- At the time, Abele was not formally credited with designing the buildings.
- Based on the buildings' architectural styles, historians believe Abele designed most of the campus buildings.

The student wants to specify why historians believe Abele designed most of Duke's campus buildings. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A) Given that most of the buildings on Duke's campus feature architectural styles that Abele had studied in Europe, historians believe Abele is the one who designed them.

B) Though Abele wasn't formally credited at the time, historians believe he designed most of the buildings on Duke's campus.

C) Most of Duke's campus buildings, which were designed by a firm Abele worked for, were designed in the Gregorian and neo-Gothic architectural styles.

D) Abele, an architect who studied Gregorian and neo-Gothic architecture in Europe, is believed to have designed most of the buildings on Duke's campus.

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.

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No Test Material On This Page

Math

27 QUESTIONS

DIRECTIONS

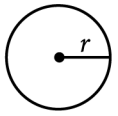
The questions in this section address a number of important math skills.
Use of a calculator is permitted for all questions.

NOTES

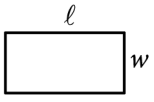
Unless otherwise indicated:

- 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.

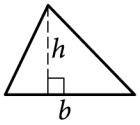
REFERENCE



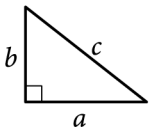
$A = \pi r^2$
$C = 2\pi r$



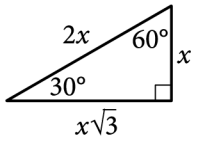
$A = \ell w$

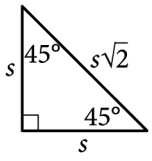


$A = \frac{1}{2}bh$

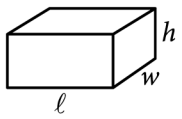


$c^2 = a^2 + b^2$

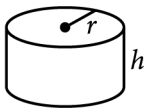




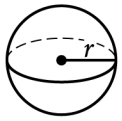
Special Right Triangles



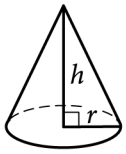
$V = \ell wh$



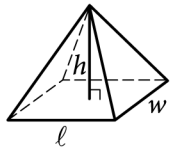
$V = \pi r^2 h$



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



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



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

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

The number of radians of arc in a circle is 2π.

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

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CONTINUE

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 (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.

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CONTINUE

1

How many yards are equivalent to 612 inches?
(1 yard = 36 inches)

A) 0.059

B) 17

C) 576

D) 22,032

2

Response	Frequency
Once a week or more	3
Two or three times a month	16
About once a month	26
A few times a year	73
Almost never	53
Never	29
Total	200

The table gives the results of a survey of 200 people who were asked how often they see a movie in a theater. How many people responded either "never" or "almost never"?

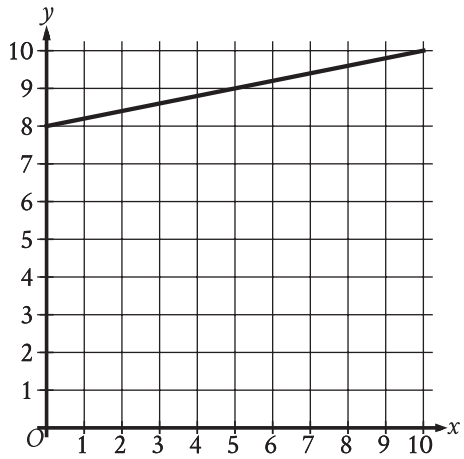
A) 24

B) 53

C) 82

D) 118

3



What is the y-intercept of the line graphed?

A) $(0, -8)$

B) $\left(0, -\frac{1}{8}\right)$

C) $(0, 0)$

D) $(0, 8)$

4

What value of p satisfies the equation $5p + 180 = 250$?

A) 14

B) 65

C) 86

D) 250

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CONTINUE

5

What is the area, in square centimeters, of a rectangle with a length of 36 centimeters and a width of 34 centimeters?

A) 70

B) 140

C) 1,156

D) 1,224

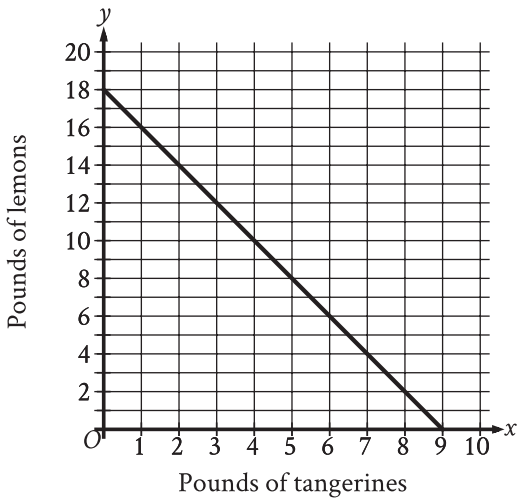
6

There are 170 blocks in a container. Of these blocks, 10% are green. How many blocks in the container are green?

7

The equation $46 = 2a + 2b$ gives the relationship between the side lengths a and b of a certain parallelogram. If $a = 9$, what is the value of b ?

8



The graph shows the possible combinations of the number of pounds of tangerines and lemons that could be purchased for $18 at a certain store. If Melvin purchased lemons and 4 pounds of tangerines for a total of $18, how many pounds of lemons did he purchase?

A) 7

B) 10

C) 14

D) 16

9

The area of a square is 64 square inches. What is the side length, in inches, of this square?

A) 8

B) 16

C) 64

D) 128

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CONTINUE

10

Connor has c dollars and Maria has m dollars. Connor has 4 times as many dollars as Maria, and together they have a total of \$25.00. Which system of equations represents this situation?

A) $c = 4m$
$c + m = 25$

B) $m = 4c$
$c + m = 25$

C) $c = 25m$
$c + m = 4$

D) $m = 25c$
$c + m = 4$

11

$$d = 16t$$

The given equation represents the distance d, in inches, where t represents the number of seconds since an object started moving. Which of the following is the best interpretation of 16 in this context?

A) The object moved a total of 16 inches.

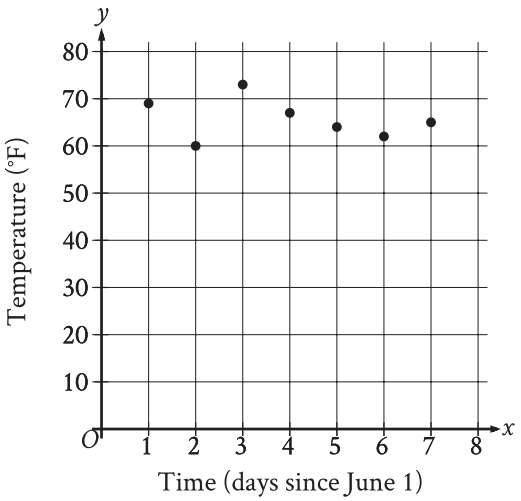
B) The object moved a total of $16t$ inches.

C) The object is moving at a rate of 16 inches per second.

D) The object is moving at a rate of $\frac{1}{16}$ inches per second.

12

The scatterplot shows the temperature y, in °F, recorded by a meteorologist at various times x, in days since June 1.



During which of the following time periods did the greatest increase in recorded temperature take place?

A) From $x = 6$ to $x = 7$

B) From $x = 5$ to $x = 6$

C) From $x = 2$ to $x = 3$

D) From $x = 1$ to $x = 2$

13

A distance of 112 furlongs is equivalent to how many feet? (1 furlong = 220 yards and 1 yard = 3 feet)

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CONTINUE

14

$$j(x) = mx + 144$$

For the linear function j, m is a constant and $j(12) = 18$. What is the value of $j(10)$?

15

$$y = 4x - 9$$
$$y = 19$$

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

A) (4, 19)

B) (7, 19)

C) (19, 4)

D) (19, 7)

16

Which expression is equivalent to $256w^2 - 676$?

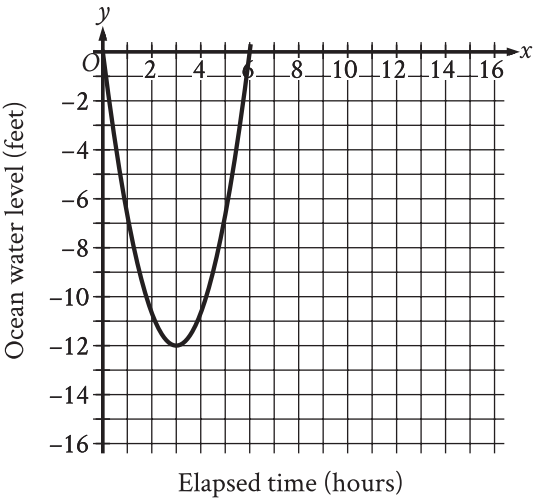
A) $(16w - 26)(16w - 26)$

B) $(8w - 13)(8w + 13)$

C) $(8w - 13)(8w - 13)$

D) $(16w - 26)(16w + 26)$

17



Scientists recorded data about the ocean water levels at a certain location over a period of 6 hours. The graph shown models the data, where $y = 0$ represents sea level. Which table gives values of x and their corresponding values of y based on the model?

A)

x	y
0	−12
0	3
3	6

B)

x	y
0	0
3	12
0	−6

C)

x	y
0	0
3	−12
6	0

D)

x	y
0	0
12	3
−6	0

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CONTINUE

18

Line k is defined by $y = 3x + 15$. Line j is perpendicular to line k in the xy-plane. What is the slope of line j ?

A) $-\frac{1}{3}$

B) $-\frac{1}{12}$

C) $-\frac{1}{18}$

D) $-\frac{1}{45}$

19

A store sells two different-sized containers of a certain Greek yogurt. The store's sales of this Greek yogurt totaled 1,277.94 dollars last month. The equation $5.48x + 7.30y = 1{,}277.94$ represents this situation, where x is the number of smaller containers sold and y is the number of larger containers sold. According to the equation, which of the following represents the price, in dollars, of each smaller container?

A) 5.48

B) $7.30y$

C) 7.30

D) $5.48x$

20

A right rectangular prism has a length of 28 centimeters (cm), a width of 15 cm, and a height of 16 cm. What is the surface area, in cm^2, of the right rectangular prism?

21

If $3x^2 - 18x - 15 = 0$, what is the value of $x^2 - 6x$?

22

Which expression is equivalent to $(d - 6)(8d^2 - 3)$?

A) $8d^3 - 14d^2 - 3d + 18$

B) $8d^3 - 17d^2 + 48$

C) $8d^3 - 48d^2 - 3d + 18$

D) $8d^3 - 51d^2 + 48$

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CONTINUE

23

A right triangle has legs with lengths of 28 centimeters and 20 centimeters. What is the length of this triangle's hypotenuse, in centimeters?

A) $8\sqrt{6}$

B) $4\sqrt{74}$

C) 48

D) 1,184

24

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

A)

Value	Frequency
70	4
80	5
90	6
100	7

B)

Value	Frequency
70	6
80	6
90	6
100	6

C)

Value	Frequency
70	7
80	6
90	6
100	7

D)

Value	Frequency
70	8
80	5
90	5
100	8

25

$$8x + 7y = 9$$
$$24x + 21y = 27$$

For each real number r, which of the following points lies on the graph of each equation in the xy-plane for the given system?

A) $\left(r, -\frac{8r}{7} + \frac{9}{7}\right)$

B) $\left(-\frac{8r}{7} + \frac{9}{7}, r\right)$

C) $\left(-\frac{8r}{7} + 9, \frac{8r}{7} + 27\right)$

D) $\left(\frac{r}{3} + 9, -\frac{r}{3} + 27\right)$

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CONTINUE

26

A salesperson's total earnings consist of a base salary of x dollars per year, plus commission earnings of 11% of the total sales the salesperson makes during the year. This year, the salesperson has a goal for the total earnings to be at least 3 times and at most 4 times the base salary. Which of the following inequalities represents all possible values of total sales s, in dollars, the salesperson can make this year in order to meet that goal?

A) $2x \le s \le 3x$

B) $\frac{2}{0.11}x \le s \le \frac{3}{0.11}x$

C) $3x \le s \le 4x$

D) $\frac{3}{0.11}x \le s \le \frac{4}{0.11}x$

27

The number a is 70% less than the positive number b. The number c is 60% greater than a. The number c is how many times b ?

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.

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No Test Material On This Page

Math

27 QUESTIONS

DIRECTIONS

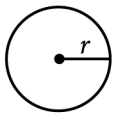
The questions in this section address a number of important math skills.
Use of a calculator is permitted for all questions.

NOTES

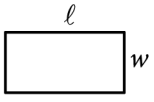
Unless otherwise indicated:

- 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.

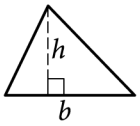
REFERENCE



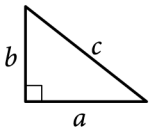
$A = \pi r^2$
$C = 2\pi r$



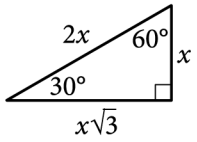
$A = \ell w$

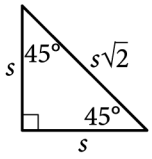


$A = \frac{1}{2}bh$

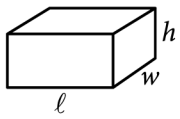


$c^2 = a^2 + b^2$

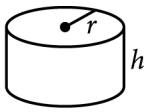




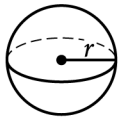
Special Right Triangles



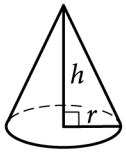
$V = \ell wh$



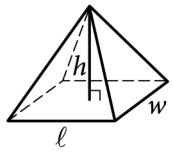
$V = \pi r^2 h$



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



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



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

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

The number of radians of arc in a circle is 2π.

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

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CONTINUE

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 (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.

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CONTINUE

1

There are 20 buttons in a bag: 8 white buttons, 2 orange buttons, and 10 brown buttons. If one of these buttons is selected at random, what is the probability of selecting a white button?

A) $\frac{2}{20}$

B) $\frac{8}{20}$

C) $\frac{10}{20}$

D) $\frac{12}{20}$

2

An employee at a restaurant prepares sandwiches and salads. It takes the employee 1.5 minutes to prepare a sandwich and 1.9 minutes to prepare a salad. The employee spends a total of 46.1 minutes preparing x sandwiches and y salads. Which equation represents this situation?

A) $1.9x + 1.5y = 46.1$

B) $1.5x + 1.9y = 46.1$

C) $x + y = 46.1$

D) $30.7x + 24.3y = 46.1$

3

In a box of pens, the ratio of black pens to red pens is 8 to 1. There are 40 black pens in the box. How many red pens are in the box?

A) 5

B) 8

C) 40

D) 320

4

The function f is defined by the equation $f(x) = 100x + 2$. What is the value of $f(x)$ when $x = 9$?

A) 111

B) 118

C) 900

D) 902

5

The length, y, of a white whale was 162 centimeters (cm) when it was born and increased an average of 4.8 cm per month for the first 12 months after it was born. Which equation best represents this situation, where x is the number of months after the whale was born and y is the length, in cm, of the whale?

A) $y = 162x$

B) $y = 162x + 162$

C) $y = 4.8x + 4.8$

D) $y = 4.8x + 162$

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CONTINUE

6

The perimeter of an isosceles triangle is 83 inches. Each of the two congruent sides of the triangle has a length of 24 inches. What is the length, in inches, of the third side?

7

If $2 + x = 60$, what is the value of $16 + 8x$?

8

The population density of Worthington is 290 people per square mile. Worthington has a population of 92,800 people. What is the area, in square miles, of Worthington?

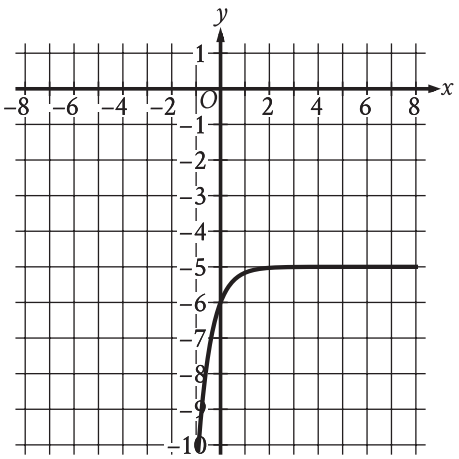
A) 102,400

B) 93,090

C) 320

D) 32

9



What is the y-intercept of the graph shown?

A) (0, −6)

B) (−6, 0)

C) (0, 0)

D) (−5, −5)

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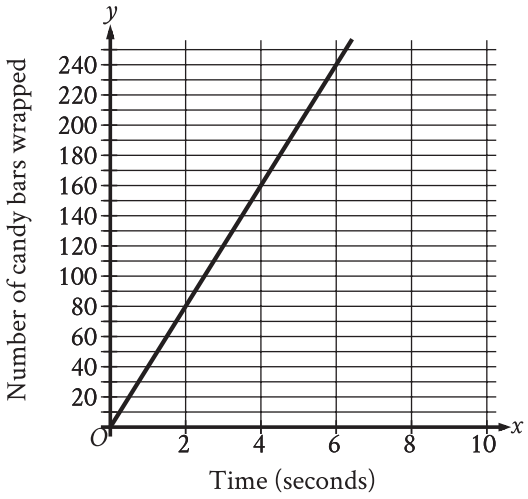
CONTINUE

10

The graph shown models the number of candy bars a certain machine wraps with a label in x seconds.



According to the graph, what is the estimated number of candy bars the machine wraps with a label per second?

A) 2

B) 40

C) 78

D) 80

11

In a right triangle, the measure of one of the acute angles is 51°. What is the measure, in degrees, of the other acute angle?

A) 6

B) 39

C) 49

D) 51

12

2, 9, 14, 23, 32

What is the mean of the data shown?

A) 14

B) 16

C) 17

D) 32

13

The function f is defined by $f(x) = 6 + \sqrt{x}$. What is the value of $f(36)$?

14

$$x + 3y = 29$$
$$3y = 11$$

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

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CONTINUE

15

On a car trip, Rhett and Jessica each drove for part of the trip, and the total distance they drove was under 220 miles. Rhett drove at an average speed of 35 miles per hour (mph), and Jessica drove at an average speed of 40 mph. Which of the following inequalities represents this situation, where r is the number of hours Rhett drove and j is the number of hours Jessica drove?

A) $35r + 40j > 220$

B) $35r + 40j < 220$

C) $40r + 35j > 220$

D) $40r + 35j < 220$

16

$$b = 42cf$$

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

A) $c = \dfrac{b}{42f}$

B) $c = \dfrac{b - 42}{f}$

C) $c = 42bf$

D) $c = 42 - b - f$

17

Davio bought some potatoes and celery. The potatoes cost \$0.69 per pound, and the celery cost \$0.99 per pound. If Davio spent \$5.34 in total and bought twice as many pounds of celery as pounds of potatoes, how many pounds of celery did Davio buy?

A) 2

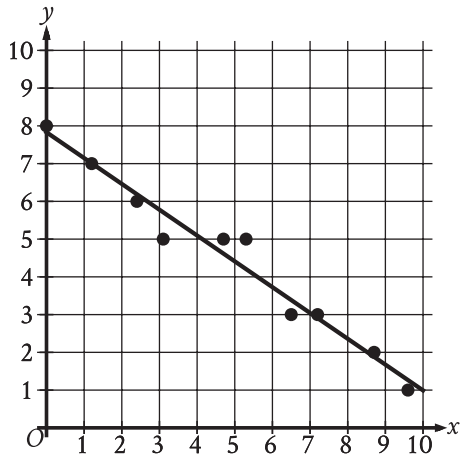
B) 2.5

C) 2.67

D) 4

18

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



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

A) 7

B) 0.7

C) −0.7

D) −7

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CONTINUE

19

Scientists collected fallen acorns that each housed a colony of the ant species *P. ohioensis* and analyzed each colony's structure. For any of these colonies, if the colony has x worker ants, the equation $y = 0.67x + 2.6$, where $20 \leq x \leq 110$, gives the predicted number of larvae, y, in the colony. If one of these colonies has 58 worker ants, which of the following is closest to the predicted number of larvae in the colony?

A) 41

B) 61

C) 83

D) 190

20

What number is 40% greater than 115?

21

For the values j and k, the ratio of j to k is 11 to 12. If j is multiplied by 17, what is k multiplied by in order to maintain the same ratio?

22

Immanuel purchased a certain rare coin on January 1. The function $f(x) = 65(1.03)^x$, where $0 \leq x \leq 10$, gives the predicted value, in dollars, of the rare coin x years after Immanuel purchased it. What is the best interpretation of the statement "$f(8)$ is approximately equal to 82" in this context?

A) When the rare coin's predicted value is approximately 82 dollars, it is 8% greater than the predicted value, in dollars, on January 1 of the previous year.

B) When the rare coin's predicted value is approximately 82 dollars, it is 8 times the predicted value, in dollars, on January 1 of the previous year.

C) From the day Immanuel purchased the rare coin to 8 years after Immanuel purchased the coin, its predicted value increased by a total of approximately 82 dollars.

D) 8 years after Immanuel purchased the rare coin, its predicted value is approximately 82 dollars.

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CONTINUE

23

x	y
−6	$n + 184$
−3	$n + 92$
0	n

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

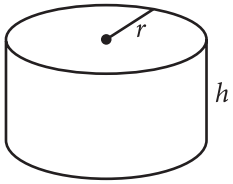
A) $-\frac{92}{3}$

B) $-\frac{3}{92}$

C) $\frac{n + 92}{-3}$

D) $\frac{2n - 92}{3}$

24



The figure shown is a right circular cylinder with a radius of r and height of h. A second right circular cylinder (not shown) has a volume that is 392 times as large as the volume of the cylinder shown. Which of the following could represent the radius R, in terms of r, and the height H, in terms of h, of the second cylinder?

A) $R = 8r$ and $H = 7h$

B) $R = 8r$ and $H = 49h$

C) $R = 7r$ and $H = 8h$

D) $R = 49r$ and $H = 8h$

25

Each side of a 30-sided polygon has one of three lengths. The number of sides with length 8 centimeters (cm) is 5 times the number of sides n with length 3 cm. There are 6 sides with length 4 cm. Which equation must be true for the value of n ?

A) $5n + 6 = 30$

B) $6n + 6 = 30$

C) $8n + 3n + 4n = 30$

D) $8(5n) + 3n + 4(6) = 30$

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CONTINUE

26

Data set F consists of 55 integers between 170 and 290. Data set G consists of all the integers in data set F as well as the integer 10. Which of the following must be less for data set F than for data set G?

I. The mean

II. The median

A) I only

B) II only

C) I and II

D) Neither I nor II

27

A right circular cone has a height of 22 centimeters (cm) and a base with a diameter of 6 cm. The volume of this cone is $n\pi$ cm^3. What is the value of n ?

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.

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PSAT™ 8/9

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.

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