



SAT Practice Test 4

Four modules, 98 questions, 2 hours 14 minutes plus a 10-minute break

Section	Questions	Time
Reading and Writing, Module 1	27 questions	32 minutes
Reading and Writing, Module 2	27 questions	32 minutes
Math, Module 1	22 questions	35 minutes
Math, Module 2	22 questions	35 minutes

1. Time each module on its own, and take the 10-minute break after Reading and Writing Module 2.
2. Mark answers on the answer sheet near the back. Work in the margins of the questions as much as you like.
3. Check your answers with the answer key, then read the explanations for every question you missed or guessed.
4. To take this test on screen or mark it up with a pen on a tablet, go to **marginsat.com**.

The questions in this section address a range 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** Because the comet had been observed for only nine nights, astronomer Ravi Menon described his estimate of its orbital period as _____. Further observations, he noted, could shift the figure by several decades in either direction.

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

- (A) arbitrary
- (B) definitive
- (C) provisional
- (D) redundant

- 2** The architect's renovation of the 1920s library was notably _____. Rather than replacing the original oak shelving and plaster ceilings, she repaired them, adding new wiring and lighting only where it could be hidden from view.

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

- (A) radical
- (B) unobtrusive
- (C) extravagant
- (D) hasty

- 3** The following text is from a novel. Ines is watching her grandmother shop at the market.

Abuela moved through the stalls slowly, lifting a tomato here, a melon there, and setting each one down again as if weighing testimony. The vendors, who knew her, did not hurry her. They had learned that her verdicts, once delivered, were final, and that a tomato she approved would soon be bought by half the women watching.

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

- (A) transported
- (B) rescued
- (C) surrendered
- (D) pronounced

- 4** Although the 1820 treaty was hailed at the time as a lasting settlement, historian Claire Dubois argues that it was in fact _____. Within a decade, both signatories had violated its central provisions, and the border it drew had been redrawn twice.

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

- (A) ephemeral
- (B) unanimous
- (C) clandestine
- (D) comprehensive

5 Archaeologists studying a Viking ship found in a Danish fjord compared the growth rings in its oak planks with tree-ring records from across northern Europe. The pattern of the rings matched records from forests near Dublin, and the outermost rings showed that the trees had been felled around 1042. The researchers concluded that the ship was built in Ireland and later sailed, or was taken, across the North Sea to Denmark.

Which choice best describes the main purpose of the text?

- (A) To argue that tree-ring dating is more reliable than other methods of dating wooden objects
- (B) To explain how researchers determined where and when a ship was built
- (C) To describe the trade routes that connected Ireland and Denmark in the eleventh century
- (D) To compare the shipbuilding techniques used in two regions of northern Europe

6 The following text is from a novel. Mateo has just started working at a hardware store.

On his first morning, Mateo was handed a broom, a clipboard, and a printed list of the store's four thousand items. By noon he had learned where the hinges were kept, and that the brass ones sold faster than the steel. By the end of the week, customers had begun asking for him by name, though he still could not have said where the store kept its rope.

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

- (A) It shows Mateo beginning to learn details about the store that go beyond the list he was given.
- (B) It suggests that Mateo is frustrated by how much he has to learn about the store.
- (C) It explains why customers began asking for Mateo by name.
- (D) It reveals that brass hinges are the store's best-selling item.

7 Text 1

Some critics worry that emoji are eroding young people's writing. If a heart or a laughing face can stand in for a sentence, they argue, writers will lose the habit of putting their feelings into words.

Text 2

Linguist Hannah Moreau analyzed thousands of text messages and found that emoji rarely replaced words. Instead, they usually appeared alongside complete sentences, signaling tone (irony, warmth, a joke), much as facial expressions and gestures accompany speech. Messages that contained emoji were, on average, no shorter than messages without them.

Based on the texts, how would Moreau (Text 2) most likely respond to the critics' concern in Text 1?

- (A) By agreeing that emoji have made text messages shorter but arguing that this change is harmless
- (B) By arguing that emoji express feelings more effectively than words do
- (C) By suggesting that the critics have underestimated how often emoji replace words
- (D) By pointing out that the concern assumes emoji substitute for written words, when her findings suggest they mostly accompany words

- 8** The following text is from a short story. Farida has come back to her hometown after ten years away.

The bakery on the corner had become a phone store, and the river path she had once walked to school was now paved and lit. Farida found she did not mind. What unsettled her was the hardware store, which had not changed at all: the same faded sign, the same cat asleep in the window (though surely not the same cat). It was as if the town had saved one thing exactly as she had left it, and she could not decide whether that was a kindness or a reproach.

Which choice best states the main idea of the text?

- (A) Farida is less troubled by the changes in her hometown than by the one place that has stayed the same.
- (B) Farida is upset that the bakery she remembers has been replaced by a phone store.
- (C) Farida regrets having left her hometown ten years earlier.
- (D) Farida is pleased to see that her hometown has been modernized.

- 9** Coffee plants produce caffeine in their leaves and seeds, where it deters many plant-eating insects. Ecologist Mira Halvorsen found that the nectar of some coffee flowers also contains caffeine, though at doses far too low to taste bitter. In her experiments, honeybees that fed on caffeinated nectar were three times as likely as bees fed plain sugar water to remember the flower's scent a day later.

According to the text, how did caffeinated nectar affect honeybees in Halvorsen's experiments?

- (A) It made them more likely to remember a flower's scent a day later.
- (B) It made them more likely to avoid coffee flowers.
- (C) It made them feed on nectar more quickly.
- (D) It deterred them from feeding on the leaves of coffee plants.

- 10** Anthropologist Nadia Sami claims that in the fishing villages she studied, older residents' knowledge of the reef was passed on mainly through shared work rather than through formal instruction.

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

- (A) Older residents could name more reef species than younger residents could.
- (B) Most villagers said in interviews that they valued the reef and wanted to protect it.
- (C) Villagers who had fished alongside older relatives could name more reef species than villagers who had completed a school course on reef ecology.
- (D) The village school began offering a course on reef ecology in 2005.

- 11** In a novel, the narrator describes her new city as both exhilarating and exhausting.

Which quotation from the novel most effectively illustrates the claim?

- (A) "I had rented a room above a laundromat, and the warm smell of detergent drifted up through the floorboards all night."
- (B) "My mother called every Sunday to ask whether I was eating enough, and every Sunday I told her that I was."
- (C) "On my first morning I bought a map and folded it so many times that the creases wore through the river."
- (D) "The subway roared beneath the street every four minutes, and every four minutes I felt the city had something urgent to tell me, though by evening I could barely keep my eyes open to hear it."

12

Native bees at four urban green spaces

Site	Area (hectares)	Native plants (%)	Native bee species
Community garden	0.4	72	31
Lawn park	6.0	8	9
Pocket prairie	0.2	95	34
Cemetery	12.0	30	17

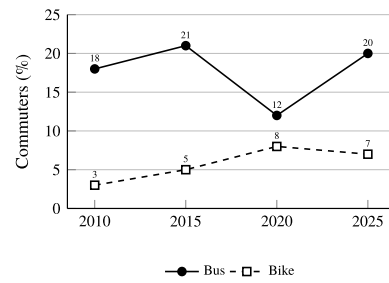
Ecologist Sun-hee Park surveyed native bee species at four green spaces in one city. She argues that even very small green spaces can support many native bee species, provided that most of their plants are native.

Which choice best describes data from the table that support Park's argument?

- (A) The cemetery, the largest site at 12.0 hectares, supported 17 native bee species.
- (B) The lawn park had the lowest percentage of native plants and the fewest native bee species.
- (C) The pocket prairie, the smallest site at 0.2 hectares, had the highest percentage of native plants and the most native bee species.
- (D) The community garden supported more native bee species than the lawn park did.

13

Commute mode, selected years



A city planner notes that the drop in bus commuting in 2020 proved temporary, while the rise in bike commuting lasted: _____

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

- (A) bus commuting fell from 21% of commuters in 2015 to 12% in 2020 but recovered to 20% by 2025, while bike commuting rose from 5% to 8% and was still 7% in 2025.
- (B) bike commuting fell from 8% of commuters in 2020 to 7% in 2025.
- (C) bus commuting rose from 18% of commuters in 2010 to 20% in 2025.
- (D) in every year shown, a larger percentage of commuters took the bus than rode a bike.

14

Many medieval European world maps distort distances wildly, place Jerusalem at their center, and fill their margins with scenes from scripture and legend. Such maps were often displayed on the walls of cathedrals rather than carried by travelers. These features suggest that _____

Which choice most logically completes the text?

- (A) medieval travelers relied mainly on maps that placed Jerusalem at their center.
- (B) the maps were probably meant mainly to convey religious and historical ideas rather than to help people find their way.
- (C) medieval mapmakers did not know the actual distances between major cities.
- (D) cathedrals were the only places where medieval people could see maps.

15 The wood frog can survive the freezing of up to two-thirds of the water in its body. As it begins to freeze, its liver releases large amounts of glucose into its blood, which limits the formation of ice inside its cells. Researchers found that wood frogs from Alaska, where winters are long and severe, built up considerably more glucose than wood frogs from Ohio. This finding suggests that _____

Which choice most logically completes the text?

- (A) wood frogs from Ohio cannot survive being frozen.
- (B) glucose is the only substance that protects wood frogs from freezing.
- (C) wood frogs in Alaska freeze more often than wood frogs in Ohio do.
- (D) the amount of glucose a wood frog builds up may be related to the severity of the winters it typically experiences.

16 The Hōkūle‘a, a replica of a traditional Polynesian voyaging canoe that _____ from Hawaii to Tahiti in 1976 using no modern instruments, has since sailed around the world.

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

- (A) sailing
- (B) to sail
- (C) sailed
- (D) having sailed

17 Few musical instruments are older than the _____ fragments of flutes carved from bird bone and mammoth ivory, found in caves in southern Germany, are more than 35,000 years old.

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

- (A) flute:
- (B) flute,
- (C) flute
- (D) flute, which

18 Among the objects recovered from the sixteenth-century wreck _____ a bronze astrolabe, its scale still legible after nearly five centuries underwater.

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

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

19 When the city’s two oldest libraries merged in 1998, _____ combined collection became the largest in the state.

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

- (A) its
- (B) their
- (C) it’s
- (D) they’re

20 To estimate how much water a forest returns to the air, hydrologists sometimes seal plastic bags around individual branches, _____ the water vapor that the leaves release over the course of a day.

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

- (A) collect
- (B) they collect
- (C) collecting
- (D) collected

- 21 Several of the region's _____ camas and bitterroot, were staple foods for the Indigenous peoples of the Columbia Plateau.

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

- (A) plants such as
- (B) plants, such as
- (C) plants; such as
- (D) plants: such as

- 22 Built for the 1889 World's Fair in Paris, _____

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

- (A) Gustave Eiffel's company designed the iron tower to stand for only twenty years.
- (B) many Parisians at first considered the iron tower an eyesore.
- (C) the iron tower was originally meant to stand for only twenty years.
- (D) twenty years was the length of time the iron tower was originally meant to stand.

- 23 Workers in ancient Egypt moved enormous stone blocks on wooden sledges. Dragging a heavy sledge across dry desert sand is difficult, because the sand heaps up in front of the runners. Wet sand, _____ is stiffer, and experiments have shown that the right amount of water can cut the force needed to pull a sledge roughly in half.

Which choice completes the text with the most logical transition?

- (A) similarly,
- (B) by contrast,
- (C) for instance,
- (D) as a result,

- 24 Many people picture the Sahara as a desert that has always looked the way it does today. _____ satellite images reveal the beds of ancient rivers beneath its sands, and rock paintings in southern Algeria show giraffes and hippopotamuses.

Which choice completes the text with the most logical transition?

- (A) Thus,
- (B) Similarly,
- (C) Moreover,
- (D) Yet

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

- The Rosetta Stone is a granite slab found in 1799 near the Egyptian town of Rashid.
- It carries the same decree written in three scripts: hieroglyphic, Demotic, and ancient Greek.
- Scholars of the time could read ancient Greek.
- Jean-François Champollion announced his decipherment of hieroglyphs in 1822.

The student wants to explain why the Rosetta Stone was useful to scholars trying to read hieroglyphs. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- (A) The Rosetta Stone, a granite slab, was found in 1799 near the Egyptian town of Rashid.
- (B) Jean-François Champollion announced his decipherment of hieroglyphs in 1822.
- (C) Because the Rosetta Stone carries the same decree in hieroglyphic, Demotic, and Greek, scholars who could read the Greek had a key to the hieroglyphs.
- (D) The Rosetta Stone carries writing in three scripts, one of which is Demotic.

26

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

- Emperor penguins and Adélie penguins both live in Antarctica.
- Emperor penguins breed during the Antarctic winter, on sea ice.
- Adélie penguins breed during the Antarctic summer, on rocky, ice-free ground.
- Both species feed mainly on krill and fish.

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

- (A) Unlike Adélie penguins, emperor penguins feed mainly on krill and fish.
- (B) Emperor penguins breed during the Antarctic winter, whereas Adélie penguins breed during the summer.
- (C) Both emperor penguins and Adélie penguins live in Antarctica, though emperors breed on sea ice.
- (D) Adélie penguins breed on rocky, ice-free ground during the Antarctic summer.

27

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

- Psychologist Ana Lucero studied whether taking notes by hand or on a laptop affects how well students understand lectures.
- Students who typed tended to record lectures nearly word for word.
- Students who wrote by hand summarized more, in their own words.
- On questions requiring conceptual understanding, the handwriting group scored higher.

The student wants to suggest a possible reason for the difference in scores. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- (A) Lucero studied whether taking notes by hand or on a laptop affects how well students understand lectures.
- (B) Students who typed recorded lectures nearly word for word, which may explain why they scored higher on conceptual questions.
- (C) On questions requiring conceptual understanding, students who wrote notes by hand scored higher than students who typed.
- (D) Students who wrote by hand summarized more in their own words, which may explain why they scored higher on conceptual questions than students who typed.

STOP. This is the end of Reading and Writing, Module 1.

The questions in this section address a range 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** Critics who call the novelist's late style _____ misread her intent: the abrupt shifts in tone that seem careless on a first reading turn out, on rereading, to be carefully placed echoes of earlier chapters.

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

- (A) meticulous
- (B) haphazard
- (C) derivative
- (D) sentimental

- 2** Although the ecologist's new estimate of the region's wolf population is 15 percent higher than earlier figures, her model does not so much _____ those figures as refine them: it starts from the same aerial counts and corrects only for animals that forest cover hid from view.

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

- (A) overturn
- (B) replicate
- (C) inflate
- (D) publicize

- 3** The following text is from a novel. Corinne, a botanist, is cataloging plants on a remote island.

Corinne had expected the island's plant life to be meager, and in one sense it was: a hundred-odd species, most of them familiar. But the familiar plants had grown strange. The dandelions stood knee-high; the clover had abandoned its creeping habit and climbed. Isolation, she wrote that evening, had not _____ the island's plants so much as given them license.

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

- (A) protected
- (B) multiplied
- (C) disguised
- (D) diminished

- 4** Economist Mariam Diallo's account of the 1970s inflation is notably _____: rather than blaming rising oil prices alone, as many accounts do, she assigns responsibility to several causes at once and weighs each against the others.

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

- (A) partisan
- (B) cursory
- (C) multifaceted
- (D) derivative

5 For decades, researchers gauged problem-solving in wild birds largely by testing whether the birds could open puzzle boxes to reach food. Such tests favor species that are curious about new objects, and many birds avoid unfamiliar things altogether. Behavioral ecologist Lena Okafor therefore built tasks from materials the birds already handled in the wild, such as bark, moss, and seed pods.

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

- (A) It identifies a limitation of an established method that motivates the approach described next.
- (B) It presents evidence that wild birds are less capable problem solvers than researchers once thought.
- (C) It explains why Okafor's tasks were more difficult than earlier puzzle-box tests.
- (D) It describes a finding from Okafor's research on wild birds.

6 Accounts of the 1890s bicycle craze often emphasize its social effects, especially the freedom it gave women to travel without escorts. Historian Tomás Reyes does not dispute those effects, but he argues that the craze's most lasting legacy was technical: the demand for bicycles drove improvements in ball bearings, steel tubing, and air-filled tires that the first automobile makers later adopted.

Which choice best describes the overall structure of the text?

- (A) It presents a historian's claim and then offers evidence that contradicts it.
- (B) It describes a technical innovation and then explains its social effects.
- (C) It summarizes a debate between two historians and concludes that neither is correct.
- (D) It notes a common emphasis in accounts of a historical development, then presents a historian's argument that a different consequence was more enduring.

7 Text 1

Geneticist Erik Holm argues that dogs were domesticated twice, once in eastern and once in western Eurasia. His evidence is ancient DNA: dog remains older than about 10,000 years fall into two distinct genetic lineages, one found mostly in the east and one mostly in the west.

Text 2

The existence of two ancient dog lineages is well established. But as zooarchaeologist Priya Natarajan notes, the same pattern would arise if dogs were domesticated once and then, as they spread, interbred extensively with different local wolf populations. With the evidence now available, Natarajan argues, the two scenarios cannot be told apart.

Based on the texts, how would Natarajan (Text 2) most likely respond to Holm's argument (Text 1)?

- (A) By denying that ancient dog remains fall into two distinct genetic lineages
- (B) By accepting that the two lineages exist but questioning whether they show that domestication happened twice
- (C) By arguing that dogs were most likely domesticated in western Eurasia
- (D) By claiming that interbreeding with wolves explains the two lineages better than two domestications do

8 Coral reefs depend on algae that live inside coral tissue. When water grows too warm, corals expel the algae and turn white, which is called bleaching. Marine biologist Hana Kaleo found that during a severe heat wave in 2019, corals on reefs that had experienced moderate heat waves in earlier years bleached less than corals on reefs with no such history. Kaleo cautions, however, that this apparent “heat memory” appeared only after moderate events: corals on reefs that had previously suffered severe bleaching were, if anything, more vulnerable.

Which choice best states the main idea of the text?

- (A) Kaleo’s research suggests that earlier exposure to moderate heat may help corals withstand later heat waves, though earlier severe bleaching does not appear to have the same effect.
- (B) Kaleo’s research shows that any past exposure to heat makes corals more resistant to bleaching.
- (C) Kaleo found that corals that survive severe bleaching become stronger and less vulnerable to later heat waves.
- (D) Kaleo explains that bleaching occurs when corals expel the algae that live inside their tissue.

9 The following text is from a novel. Rahel, a translator, is working on a difficult passage.

The sentence was eleven words long in the original, and Rahel had been staring at it for an hour. Its meaning was not the problem; she could have explained it to a child. The problem was its rhythm, which rose through the first nine words and then fell, all at once, on the last two. Every English version she tried either kept the meaning and flattened the fall, or kept the fall and lost the sense of the middle clause.

According to the text, what is the main difficulty Rahel faces in translating the sentence?

- (A) She cannot find English words that match the final two words of the original.
- (B) She does not fully understand what the sentence means.
- (C) She cannot preserve both the sentence’s meaning and its rhythm in English.
- (D) The sentence is too long to translate as a single English sentence.

10 Sociologist Daniel Ferreira hypothesizes that the decline in local newspaper subscriptions in the towns he studied was caused mainly by the growth of free online news rather than by changes in the newspapers themselves.

Which finding, if true, would most directly weaken Ferreira’s hypothesis?

- (A) Subscriptions fell fastest in the towns where high-speed internet became available earliest.
- (B) Among towns with similar internet access, subscriptions fell sharply where newspapers cut their reporting staffs by more than half and held roughly steady where newspapers kept their staffs.
- (C) Most former subscribers said in surveys that they now read news online.
- (D) Subscriptions to national newspapers also declined during the period Ferreira studied.

11

In the poem “Inventory,” the speaker suggests that ordinary objects can call up memories more vividly than photographs do.

Which quotation from the poem most effectively illustrates the claim?

- (A) “The photographs are in a box I rarely open; / they show us squinting into other summers.”
- (B) “My father’s reading glasses on the sill / bring back his voice more surely than any picture of his face.”
- (C) “I kept the chipped blue bowl, the broken clock, / the coat that still hangs crooked on its hook.”
- (D) “Each picture fixes one afternoon in place, / the light exactly as it fell that day.”

12

Average growth of young kelp (cm per day)

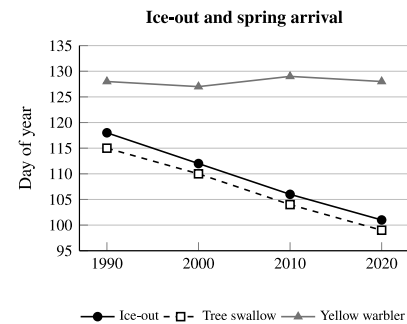
Water temperature	Bull kelp	Giant kelp
10°C	6.1	5.9
15°C	6.4	6.6
20°C	3.2	6.2

Marine biologists grew young bull kelp and giant kelp in tanks held at three temperatures. They suggest that giant kelp may be better suited than bull kelp to warming coastal waters.

Which choice best describes data from the table that support the biologists’ suggestion?

- (A) At 10°C, bull kelp grew slightly faster than giant kelp, 6.1 cm per day compared with 5.9.
- (B) Bull kelp grew fastest at 15°C, at 6.4 cm per day.
- (C) At 15°C, giant kelp grew faster than bull kelp, 6.6 cm per day compared with 6.4.
- (D) The two species grew at similar rates at 10°C, but at 20°C giant kelp grew 6.2 cm per day while bull kelp’s growth fell to 3.2.

13



Biologists recorded the day of the year when ice left a northern lake each spring (ice-out) and the average spring arrival day of two migratory bird species. They claim that tree swallows have shifted their arrival to track the earlier ice-out, but yellow warblers have not.

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

- (A) Yellow warblers arrived later than tree swallows in every year shown.
- (B) From 1990 to 2020, ice-out moved about 17 days earlier and tree swallow arrival moved about 16 days earlier, while yellow warbler arrival stayed near day 128.
- (C) Tree swallows arrived before ice-out in every year shown.
- (D) Ice-out moved from about day 118 in 1990 to about day 101 in 2020.

- 14** Researchers analyzing residues inside 5,000-year-old ceramic jars from a site in northern China found traces of barley, millet, and an edible tuber, along with chemical signs of fermentation. Elsewhere in the region, barley does not appear as a significant food crop until several thousand years later. The researchers suggest that _____

Which choice most logically completes the text?

- (A) barley was the main food crop at the site 5,000 years ago.
- (B) barley may first have been brought to the region for brewing rather than as a staple food.
- (C) people at the site did not yet know how to ferment grains.
- (D) the jars must have been made somewhere other than northern China.

- 15** In a study of red foxes in a large city, researchers found that foxes living in neighborhoods with many backyard gardens had smaller home ranges than foxes in neighborhoods with few gardens. One explanation is that gardens supply food, so foxes there need not travel far. However, foxes in neighborhoods where residents deliberately fed them had home ranges no smaller than those of foxes in neighborhoods with few gardens, even though the fed foxes got a larger share of their diet from people than garden-neighborhood foxes did. These findings suggest that _____

Which choice most logically completes the text?

- (A) foxes that are fed by residents travel farther than other urban foxes.
- (B) backyard gardens provide more food for foxes than residents deliberately provide.
- (C) some feature of gardens other than the food they provide may account for the smaller home ranges.
- (D) urban foxes avoid neighborhoods where residents feed them.

- 16** Ada Lovelace, the daughter of the poet Lord Byron, who left the family when she was an infant, _____ what many historians regard as the first published computer program in 1843.

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

- (A) writing
- (B) having written
- (C) to write
- (D) wrote

- 17** Sea otters often wrap themselves in strands of kelp while they _____ drifting away from their feeding grounds as they rest on the surface.

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

- (A) sleep, keeping themselves from
- (B) sleep, they keep themselves from
- (C) sleep, kept themselves from
- (D) sleep, to have kept themselves from

- 18** The expedition reached the summit on its third _____ the weather allowed the climbers only twenty minutes at the top.

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

- (A) attempt, however,
- (B) attempt however,
- (C) attempt; however,
- (D) attempt, however

- 19** The number of languages spoken in Papua New Guinea, a country slightly larger than California, _____ more than 800.

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

- (A) are
- (B) have been
- (C) were
- (D) is

- 20** The tiny backward-facing spines that cover the surface of a cat's _____ help it groom by catching loose fur.

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

- (A) tongue,
- (B) tongue;
- (C) tongue
- (D) tongue—

- 21** When the museum reopened in 2022 after a four-year renovation, visitors discovered that the curators _____ the galleries by theme rather than by historical period.

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

- (A) had rearranged
- (B) rearrange
- (C) will rearrange
- (D) are rearranging

- 22** The coast _____ can grow to more than 110 meters in height.

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

- (A) redwood—the tallest tree species on Earth—
- (B) redwood, the tallest tree species on Earth—
- (C) redwood—the tallest tree species on Earth,
- (D) redwood the tallest tree species on Earth,

- 23** Early telescopes made with lenses suffered from chromatic aberration: because a lens bends different colors of light by different amounts, the images were fringed with color. Isaac Newton concluded that the problem could not be fully solved with lenses. _____ he built a telescope that gathered light with a curved mirror, which reflects all colors at the same angle.

Which choice completes the text with the most logical transition?

- (A) Similarly,
- (B) Nevertheless,
- (C) Instead,
- (D) For example,

- 24** The Voynich manuscript, a fifteenth-century book written in an unknown script, has resisted every attempt at decipherment, and some researchers have concluded that it is an elaborate hoax. _____ statistical analyses show that its “words” follow patterns of frequency and repetition much like those of natural languages, which a hoaxer of that period would have found very difficult to fake.

Which choice completes the text with the most logical transition?

- (A) Accordingly,
- (B) Likewise,
- (C) For instance,
- (D) Still,

25

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

- Builders at Chaco Canyon in present-day New Mexico aligned some of its great houses with the position of the sun at the solstices.
- Builders at Newgrange in Ireland designed a passage tomb so that sunlight enters its inner chamber at sunrise on the winter solstice.
- Chaco Canyon's great houses were built between about 850 and 1150 CE.
- Newgrange was built around 3200 BCE.

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

- (A) While Chaco Canyon's great houses were built between about 850 and 1150 CE, Newgrange was built around 3200 BCE.
- (B) Like Newgrange, which was built around 3200 BCE, Chaco Canyon's great houses were built more than four thousand years later.
- (C) At both Chaco Canyon and Newgrange, builders designed structures to align with the sun at the solstices.
- (D) Newgrange is a passage tomb in Ireland, whereas Chaco Canyon is known for its great houses.

26

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

- Coffee, tea, and cacao plants all produce caffeine.
- Coffee plants evolved the ability to make caffeine independently of tea and cacao plants.
- Caffeine in a plant's leaves deters many insects that would otherwise eat them.
- Caffeine that leaches into the soil from fallen leaves can slow the growth of nearby seedlings, reducing competition.

The student wants to summarize two ways caffeine may benefit the plants that produce it. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- (A) Caffeine may help the plants that produce it by deterring leaf-eating insects and by slowing the growth of competing seedlings nearby.
- (B) Coffee plants evolved the ability to make caffeine independently of tea and cacao, and caffeine deters many leaf-eating insects.
- (C) Caffeine may help nearby seedlings grow and may deter insects from eating a plant's leaves.
- (D) Coffee, tea, and cacao plants all produce caffeine, which leaches into the soil from their fallen leaves.

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

- In 2015, paleontologists announced the discovery of fossils of a new human relative, *Homo naledi*, in a South African cave.
- *Homo naledi* had a brain less than half the size of a modern human's.
- Before the fossils were dated, many researchers assumed that a species with such a small brain must have lived more than a million years ago.
- The fossils were later dated to between 236,000 and 335,000 years ago.

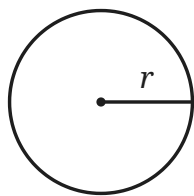
The student wants to emphasize why the dating of the fossils surprised researchers. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- (A) Surprisingly, the fossils of *Homo naledi* were found in a cave in South Africa.
- (B) *Homo naledi* fossils, discovered in South Africa in 2015, were dated to between 236,000 and 335,000 years ago.
- (C) Because *Homo naledi* had such a small brain, researchers dated its fossils to more than a million years ago.
- (D) Although *Homo naledi* had a brain less than half the size of a modern human's, its fossils proved to be only 236,000 to 335,000 years old, far younger than many researchers had expected for so small-brained a species.

STOP. This is the end of Reading and Writing, Module 2.

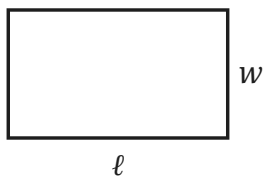
Math Reference Sheet

Use it during both Math modules

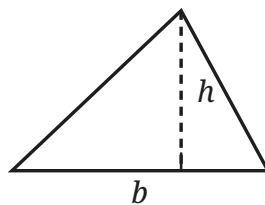


$$A = \pi r^2$$

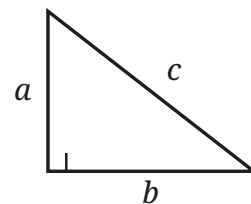
$$C = 2\pi r$$



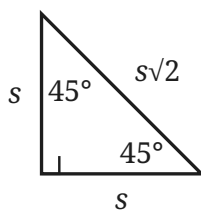
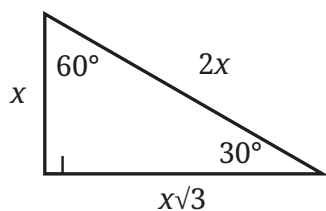
$$A = \ell w$$



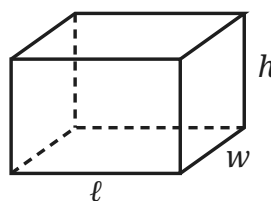
$$A = \frac{1}{2}bh$$



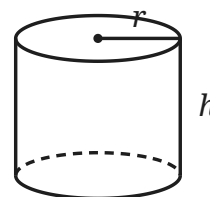
$$c^2 = a^2 + b^2$$



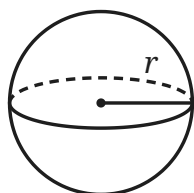
Special Right Triangles



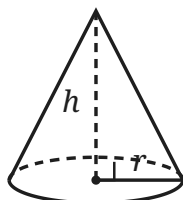
$$V = \ell wh$$



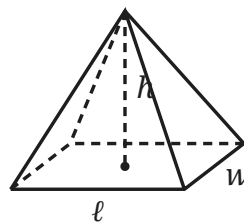
$$V = \pi r^2 h$$



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



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



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

- 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.

The questions in this section address a number of important math skills.

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- Enter a mixed number such as $3\frac{1}{2}$ as an improper fraction ($7/2$) or as a decimal (3.5).
- Leave out symbols such as a percent sign, comma, or dollar sign.

Examples

Answer	Acceptable ways to enter answer	Unacceptable: will NOT receive credit
3.5	3.5 3.50 7/2	31/2 3 1/2
$\frac{2}{3}$	2/3 .6666 .6667 0.666 0.667	0.66 .66 0.67 .67
$-\frac{1}{3}$	-1/3 -.3333 -0.333	-.33 -0.33

1 If $\frac{3x}{4} - 2 = 7$, what is the value of $3x$?

- (A) 12
- (B) 27
- (C) 9
- (D) 36

2 A recipe uses flour and sugar in a ratio of 5 to 2 by weight. If 350 grams of flour are used, how many grams of sugar are needed?

- (A) 70
- (B) 140
- (C) 175
- (D) 875

- 3 The total cost C , in dollars, to rent a kayak for h hours is given by $C = 12h + 15$. What is the best interpretation of 12 in this context?

(A) The cost per hour to rent the kayak
(B) A fixed fee charged for every rental
(C) The total cost to rent the kayak for one hour
(D) The number of hours the kayak is rented

- 4 In triangle ABC , the measure of angle A is 40° , and the measure of angle B is 3 times the measure of angle C . What is the measure, in degrees, of angle B ?

Your answer

- 5 A car's value decreases by 15% each year. The car was bought for \$28,000. Which expression gives the car's value, in dollars, m months after it was bought?

(A) $28,000(0.85)^{12m}$
(B) $28,000(0.85)^{m/12}$
(C) $28,000(0.9875)^m$
(D) $28,000(0.15)^{m/12}$

6
$$x + 2y = 14$$

$$3x - 2y = 2$$

If (x, y) is the solution to the system of equations, what is the value of y ?

Your answer

- 7 The mean of 9 numbers is 20. When a tenth number is added, the mean of the 10 numbers is 22. What is the tenth number?

(A) 22
(B) 24
(C) 42
(D) 40

- 8 In the xy -plane, what is the y -coordinate of the vertex of the graph of $f(x) = x^2 - 8x + 12$?

Your answer

- 9 A phone plan costs \$30 per month plus \$0.10 for each text message after the first 200 texts in a month. Kai wants his bill to be at most \$45 this month. What is the greatest number of text messages Kai can send this month?

(A) 150
(B) 450
(C) 650
(D) 350

- 10 A circle in the xy -plane has its center at $(-2, 5)$ and passes through the point $(4, -3)$. Which of the following is an equation of the circle?

(A) $(x - 2)^2 + (y + 5)^2 = 100$
(B) $(x + 2)^2 + (y - 5)^2 = 10$
(C) $(x + 2)^2 + (y - 5)^2 = 100$
(D) $(x - 2)^2 + (y + 5)^2 = 10$

- 11 A train travels 150 miles in 2.5 hours. At this rate, how many minutes will it take the train to travel 84 miles?

Your answer

- 12 The function f is defined by $f(x) = \frac{x+3}{x-2}$. For what value of x is $f(x) = 4$?

(A) $\frac{11}{3}$
(B) $\frac{5}{3}$
(C) 3
(D) $\frac{11}{5}$

- 13** A truck holds 66 units of cargo space. Each small box takes 4 units and each large box takes 5 units. When the truck is full, it holds 3 more small boxes than large boxes. What is the total number of boxes in the truck?

(A) 6
(B) 9
(C) 18
(D) 15

- 14** Which expression is equivalent to $\frac{x^2 - 9}{x^2 + x - 6}$ for $x \neq -3$ and $x \neq 2$?

(A) $\frac{x - 3}{x - 2}$
(B) $\frac{x + 3}{x + 2}$
(C) $\frac{x - 3}{x + 2}$
(D) $\frac{-9}{x - 6}$

- 15** A bag contains 6 red, 4 blue, and 10 green marbles. Two marbles are drawn at random, one after the other, without replacement. What is the probability that both marbles are green?

(A) $\frac{1}{4}$
(B) $\frac{9}{38}$
(C) $\frac{1}{2}$
(D) $\frac{9}{40}$

- 16** If $2^{x+3} = 8^{x-1}$, what is the value of x ?

(A) 1
(B) 2
(C) 3
(D) 6

- 17** In a right triangle, one of the acute angles measures θ° , and $\cos \theta^\circ = 0.28$. What is the value of $\sin(90^\circ - \theta^\circ)$?

(A) 0.72
(B) 0.96
(C) 0.28
(D) 3.57

- 18** The graph of $y = -(x - 3)^2 + 16$ in the xy -plane intersects the x -axis at two points. What is the distance between these two points?

(A) 4
(B) 6
(C) 8
(D) 16

- 19** A plant grew at a constant rate after it was potted. It was 12 centimeters tall 4 days after it was potted and 27 centimeters tall 10 days after it was potted. How tall, in centimeters, was the plant when it was potted?

(A) 2
(B) 2.5
(C) 4.5
(D) 10

- 20** The length of a rectangle is 4 more than twice its width. The perimeter of the rectangle is 50. What is the area of the rectangle?

Your answer

- 21** In the equation $2x^2 - 12x + c = 0$, c is a constant. If the equation has exactly one real solution, what is the value of c ?

Your answer

- 22 The function f is defined by $f(x) = x^2 + bx + 20$, where b is a constant, and the function g is defined by $g(x) = f(x - 3)$. If the vertex of the graph of $y = g(x)$ in the xy -plane has an x -coordinate of 5, what is the value of b ?

- (A) -16
- (B) -4
- (C) 4
- (D) -10

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- 1** In the equation $\frac{2}{3}(6x - 9) = 4x - k$, k is a constant. If the equation is true for all values of x , what is the value of k ?

Your answer

- 2** Line ℓ is parallel to the line $3x - 4y = 12$ and passes through the point $(2, -1)$. What is the y -coordinate of the y -intercept of line ℓ ?

- (A) -3
(B) $-\frac{5}{2}$
(C) $-\frac{1}{2}$
(D) $\frac{1}{2}$

- 3 The equation $x^2 - 6x + k = 0$, where k is a constant, has two real solutions, and one solution is 4 greater than the other. What is the value of k ?

(A) 4
(B) 8
(C) 9
(D) 5

- 4 Points A , B , and C lie on a circle with radius 18. The measure of inscribed angle ACB is 35° . What is the length of minor arc AB ?

(A) 7π
(B) 3.5π
(C) 14π
(D) 35π

- 5 In 2020, 40% of a town's 25,000 residents commuted by bus. From 2020 to 2024, the town's population increased by 12%, and the number of residents who commute by bus increased by 20%. To the nearest tenth of a percent, what percent of the town's residents commuted by bus in 2024?

Your answer

- 6 The polynomial $p(x) = x^3 + ax^2 - 4x - 12$, where a is a constant, has $x + 2$ as a factor. What is the sum of all the zeros of p ?

(A) -3
(B) 3
(C) -1
(D) 12

7

$$ax + 3y = 12$$

$$2x + by = 8$$

In the system of equations, a and b are constants. If the system has infinitely many solutions, what is the value of $a + b$?

(A) 3
(B) 4.5
(C) 5
(D) 6.5

8

A tank that holds 200 gallons contains 40 gallons of water. Water flows in at 3.5 gallons per minute and drains out at 1.2 gallons per minute at the same time. To the nearest minute, how many minutes will it take for the tank to become full?

(A) 46
(B) 57
(C) 87
(D) 70

9

Two cones are similar. The height of the larger cone is 1.5 times the height of the smaller cone. The volume of the smaller cone is 64π cubic centimeters. What is the volume, in cubic centimeters, of the larger cone?

(A) 96π
(B) 144π
(C) 216π
(D) 256π

10

The function $P(t) = 5,000(1.02)^{4t}$ models the value, in dollars, of an investment t years after it was made. Which statement best describes how the value changes?

(A) It increases by 2% each year.
(B) It increases by 8% each year.
(C) It increases by 2% every three months.
(D) It increases by 8.24% every three months.

11 What is the solution to the equation $\frac{5}{x-1} = \frac{3}{x+3}$?

Your answer

12 A researcher randomly assigned 300 adult volunteers to two groups. One group drank a cup of green tea every evening for a month, and the other drank a cup of water. The green tea group reported better sleep, on average, and the difference was unlikely to be due to chance. Which conclusion is best supported?

- (A) Drinking green tea every evening causes better sleep for all adults.
- (B) Among adults similar to the volunteers, drinking green tea every evening is likely to cause better reported sleep.
- (C) The volunteers who chose to drink green tea were probably better sleepers to begin with.
- (D) No conclusion about cause can be drawn, because the study used a sample rather than the whole population.

13 In the xy -plane, the graphs of $y = 2x^2 - 5$ and $y = kx - 7$, where k is a constant, intersect at exactly one point, and that point has a positive x -coordinate. What is the value of k ?

Your answer

14 In the xy -plane, an angle of θ radians is drawn in standard position, where $\pi < \theta < \frac{3\pi}{2}$, and $\sin \theta = -\frac{5}{13}$. What is the value of $\tan \theta$?

- (A) $-\frac{5}{12}$
- (B) $\frac{5}{12}$
- (C) $-\frac{12}{5}$
- (D) $\frac{12}{5}$

15 The table shows selected values of the function f . The function g is defined by $g(x) = f(2x) + 1$. What is the value of $g(3)$?

x	2	3	4	6
$f(x)$	7	-1	5	10

- (A) 0
- (B) 14
- (C) 21
- (D) 11

16 A school needs at least 40 calculators. Basic calculators cost \$18 each and graphing calculators cost \$95 each. The school can spend at most \$2,000 and wants at least 10 graphing calculators. What is the greatest number of graphing calculators the school can buy?

- (A) 16
- (B) 17
- (C) 20
- (D) 21

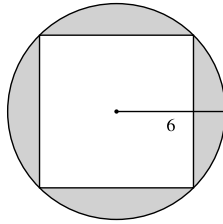
17 A store took 20% off the original price of a jacket. Then an 8% sales tax was added to the sale price, for a total of \$86.40. What was the original price of the jacket, in dollars?

Your answer

18 What is the solution set of the equation $\sqrt{x+7} = x-5$?

- (A) $\{2\}$
- (B) $\{9\}$
- (C) $\{2, 9\}$
- (D) $\{-2, -9\}$

- 19 A square is inscribed in a circle with radius 6, as shown. What is the area of the shaded region, which is inside the circle but outside the square?



- (A) $36\pi - 144$
(B) $36\pi - 36$
(C) $144 - 36\pi$
(D) $36\pi - 72$
- 20 The function f is defined by $f(x) = ax^2 + bx + c$. If $f(-1) = 0$, $f(3) = 0$, and $f(1) = -8$, what is the value of $f(4)$?

Your answer

- 21 Class A has 18 students, and their mean score on a test was 82. Class B's mean score on the same test was 87. The mean score of all the students in both classes combined was 84. How many students are in class B?

- (A) 8
(B) 10
(C) 12
(D) 15

- 22 The function f is defined by $f(x) = a(x + 2)(x - 6)$, where a is a constant, and $f(0) = -6$. What is the minimum value of f ?

- (A) -8
(B) -6
(C) -12
(D) -16

STOP. This is the end of Math, Module 2.

Answer Sheet

Fill in one bubble per question. Write grid-in answers in the boxes.

Reading and Writing, Module 1

- | | |
|--------------------|--------------------|
| 1 (A) (B) (C) (D) | 2 (A) (B) (C) (D) |
| 3 (A) (B) (C) (D) | 4 (A) (B) (C) (D) |
| 5 (A) (B) (C) (D) | 6 (A) (B) (C) (D) |
| 7 (A) (B) (C) (D) | 8 (A) (B) (C) (D) |
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| 23 (A) (B) (C) (D) | 24 (A) (B) (C) (D) |
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| 27 (A) (B) (C) (D) | |

Math, Module 1

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Reading and Writing, Module 2

- | | |
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| 1 (A) (B) (C) (D) | 2 (A) (B) (C) (D) |
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| 25 (A) (B) (C) (D) | 26 (A) (B) (C) (D) |
| 27 (A) (B) (C) (D) | |

Math, Module 2

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|-------------------------|-------------------------|
| 1 <input type="text"/> | 2 (A) (B) (C) (D) |
| 3 (A) (B) (C) (D) | 4 (A) (B) (C) (D) |
| 5 <input type="text"/> | 6 (A) (B) (C) (D) |
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| 17 <input type="text"/> | 18 (A) (B) (C) (D) |
| 19 (A) (B) (C) (D) | 20 <input type="text"/> |
| 21 (A) (B) (C) (D) | 22 (A) (B) (C) (D) |

Answer Key

Count your correct answers in each module

Reading and Writing, Module 1

1	C	Words in Context
2	B	Words in Context
3	D	Words in Context
4	A	Words in Context
5	B	Text Structure and Purpose
6	A	Text Structure and Purpose
7	D	Cross-Text Connections
8	A	Central Ideas and Details
9	A	Central Ideas and Details
10	C	Command of Evidence (Textual)
11	D	Command of Evidence (Textual)
12	C	Command of Evidence (Quantitative)
13	A	Command of Evidence (Quantitative)
14	B	Inferences
15	D	Inferences
16	C	Form, Structure, and Sense
17	A	Boundaries
18	D	Form, Structure, and Sense
19	B	Form, Structure, and Sense
20	C	Form, Structure, and Sense
21	B	Boundaries
22	C	Form, Structure, and Sense
23	B	Transitions
24	D	Transitions
25	C	Rhetorical Synthesis
26	B	Rhetorical Synthesis
27	D	Rhetorical Synthesis

Math, Module 1

1	D	Linear equations in one variable
2	B	Ratios and proportions
3	A	Linear functions (interpretation)
4	105	Lines, angles, and triangles
5	B	Nonlinear functions (exponential)
6	5	Systems of linear equations
7	D	One-variable data: center
8	-4	Nonlinear functions (quadratic)
9	D	Linear inequalities

Reading and Writing, Module 2

1	B	Words in Context
2	A	Words in Context
3	D	Words in Context
4	C	Words in Context
5	A	Text Structure and Purpose
6	D	Text Structure and Purpose
7	B	Cross-Text Connections
8	A	Central Ideas and Details
9	C	Central Ideas and Details
10	B	Command of Evidence (Textual)
11	B	Command of Evidence (Textual)
12	D	Command of Evidence (Quantitative)
13	B	Command of Evidence (Quantitative)
14	B	Inferences
15	C	Inferences
16	D	Form, Structure, and Sense
17	A	Form, Structure, and Sense
18	C	Boundaries
19	D	Form, Structure, and Sense
20	C	Boundaries
21	A	Form, Structure, and Sense
22	A	Boundaries
23	C	Transitions
24	D	Transitions
25	C	Rhetorical Synthesis
26	A	Rhetorical Synthesis
27	D	Rhetorical Synthesis

Math, Module 2

1	6	Linear equations (infinitely many solutions)
2	B	Linear functions (parallel lines)
3	D	Nonlinear equations (quadratic)
4	A	Circles (inscribed angles)
5	42.9	Percentages
6	A	Polynomials (factors and zeros)
7	C	Systems of linear equations (infinitely many solutions)
8	D	Rates

10	C	Circles
11	84	Rates and units
12	A	Rational equations
13	D	Systems of linear equations
14	A	Equivalent expressions (rational)
15	B	Probability
16	C	Exponents
17	C	Right triangle trigonometry
18	C	Nonlinear functions (quadratic)
19	A	Linear functions
20	126	Area and perimeter
21	18	Nonlinear equations: discriminant
22	B	Function transformations

9	C	Volume and similarity
10	C	Exponential functions (interpretation)
11	-9	Rational equations
12	B	Evaluating statistical claims
13	4	Nonlinear systems
14	B	Trigonometry (unit circle)
15	D	Functions (tables and transformations)
16	A	Systems of linear inequalities
17	100	Percentages
18	B	Radical equations
19	D	Circles and polygons
20	10	Nonlinear functions (quadratic)
21	C	One-variable data (combined means)
22	A	Nonlinear functions (quadratic)

Estimate your Reading and Writing score

Add your correct answers from both Reading and Writing modules (out of 54).

Raw	Score	Raw	Score
0	200	28	520
1	220	29	520
2	240	30	530
3	250	31	540
4	270	32	550
5	290	33	560
6	300	34	570
7	320	35	580
8	340	36	580
9	350	37	590
10	360	38	600
11	370	39	610
12	380	40	620
13	390	41	630
14	400	42	640
15	410	43	650
16	420	44	660
17	420	45	680
18	430	46	690
19	440	47	700
20	450	48	710
21	460	49	730
22	470	50	740
23	480	51	760
24	480	52	770
25	490	53	780
26	500	54	800
27	510		

Estimate your Math score

Add your correct answers from both Math modules (out of 44). Add the two section scores for your total.

Raw	Score	Raw	Score
0	200	23	540
1	220	24	550
2	240	25	560
3	260	26	570
4	280	27	580
5	310	28	590
6	330	29	600
7	350	30	610
8	370	31	620
9	390	32	640
10	400	33	650
11	410	34	660
12	430	35	680
13	440	36	690
14	450	37	700
15	460	38	710
16	470	39	730
17	480	40	740
18	490	41	760
19	500	42	770
20	510	43	790
21	520	44	800
22	530		

Reading and Writing, Module 1

1. C. The colon explains the description: more data could move the estimate by decades, so it is a working figure subject to change, *provisional*. *Definitive* is the opposite. *Arbitrary* goes too far: the estimate rests on nine nights of real observations.

2. B. She kept the original features and hid the new work, so the renovation doesn't call attention to itself: *unobtrusive*. *Radical* is the opposite of repairing what was there. Nothing addresses cost (*extravagant*) or speed (*hasty*).

3. D. The courtroom language ("weighing testimony," "verdicts") sets up the meaning: a verdict that has been *delivered* has been announced, or *pronounced*. *Transported* is the everyday sense (delivering goods), which a market setting makes tempting, but verdicts aren't carried anywhere.

4. A. "Although ... lasting" sets up the opposite: the treaty broke down within ten years, so its effect was short-lived, *ephemeral*. *Comprehensive* (covering everything) doesn't contrast with "lasting." Nothing suggests secrecy (*clandestine*) or a vote (*unanimous*).

5. B. Each sentence moves toward one result: the rings revealed both the place (Dublin) and the date (about 1042). A would need a comparison with other methods, which the text never makes. C and D bring in topics (trade routes, building techniques) the text doesn't discuss.

6. A. The list names items; the underlined sentence adds knowledge no list contains (which hinges actually sell), the start of Mateo's real expertise. C is the trap: the customers come up only in the next sentence, and the text never says why they ask for him. D overreads "faster than the steel" into "best-selling item." Nothing shows frustration (B).

7. D. The critics' worry depends on emoji *standing in for* sentences. Moreau found the opposite: emoji mostly sit beside full sentences, and messages with emoji were no shorter. A contradicts that length finding. C reverses her result. B makes a claim about effectiveness she never makes.

8. A. Farida "did not mind" the changes; what "unsettled her" was the unchanged hardware store. B contradicts "did not mind." D overstates it: not minding isn't the same as being pleased. C may be hinted by "reproach," but she can't even decide that, so regret isn't the main idea.

9. A. The last sentence states the effect: bees on caffeinated nectar were three times as likely to remember the scent a day later. D mixes up two parts of the text: deterrence applies to insects eating leaves, not to bees drinking nectar. B and C aren't stated.

10. C. The claim compares two routes for passing on knowledge (shared work vs formal instruction), so support has to compare them. C does: fishing with elders beat the school course. A shows older residents know more, but not *how* knowledge moves to the young. B and D don't bear on how knowledge is transmitted.

11. D. The claim has two halves. D gives both: the city seems to have "something urgent to tell" her (exhilarating), and by evening she can hardly stay awake (exhausting). C suggests eager exploration but no exhaustion; A and B describe daily details with neither feeling.

12. C. Park's argument has two conditions (small *and* mostly native) and a result (many species). The pocket prairie meets both conditions and has the most species. B is accurate, but the lawn park is large, so it says nothing about *small* spaces. D compares two sites without mentioning size or native plants.

13. A. The statement makes two claims: the bus drop was temporary, and the bike rise held. A covers both (bus 21 → 12 → 20; bike 5 → 8, still 7). B is true but, alone, points the wrong way: it shows bike commuting slipping. C skips the 2020 drop entirely, and D compares the modes rather than their changes.

14. B. Distorted distances, a symbolic center, scriptural scenes, and display on cathedral walls all point away from practical navigation and toward teaching. A contradicts "rather than carried by travelers." C and D overreach: the distortion could be deliberate, and nothing says cathedrals were the *only* place maps were seen.

15. D. Frogs from the harsher climate built up more glucose, so glucose levels may track winter severity. A goes too far (less glucose isn't none). B overreaches with "only." C claims a frequency of freezing that the text never measures.

16. C. The blank is the verb of the relative clause "that _____ from Hawaii to Tahiti," and a relative clause needs its own finite verb: *sailed*. The sentence's main verb ("has since sailed") comes later, after the interrupting phrase. A, B, and D are nonfinite.

17. A. The first clause makes a claim, and the second is the evidence for it. A colon introduces an explanation after a complete clause. B creates a comma splice, C runs the clauses together, and D attaches "which" to a clause that already has its own subject.

18. D. This sentence is inverted: the subject comes after the verb. Ask what was recovered: “a bronze astrolabe,” singular, so the verb is *was* (past tense for a past recovery). “Objects” sits in the opening prepositional phrase and isn’t the subject.

19. B. The possessive refers to the two libraries, which are plural: *their*. A is singular. C and D are contractions (“it is,” “they are”), not possessives.

20. C. The sentence already has its main clause (“hydrologists ... seal plastic bags”). The phrase after the comma explains what the bags do, so it takes the nonfinite *collecting*. B is a comma splice; A and D are finite verbs with nothing to attach them to.

21. B. “Such as camas and bitterroot” is a nonessential example phrase, and it closes with a comma after “bitterroot.” It needs an opening comma to match. A leaves it unopened. C and D use punctuation that can’t introduce a phrase in the middle of a clause.

22. C. The opening phrase describes something that was *built*, so the word right after the comma must name it: *the iron tower*. A makes Eiffel’s company the thing built, B makes Parisians the thing built, and D makes “twenty years” the thing built.

23. B. Dry sand heaps up; wet sand is stiffer and lets the sledge slide. The sentence sets the two against each other: *by contrast*. “Similarly” implies the two kinds of sand behave alike. “As a result” implies wetness follows from the heaping.

24. D. The evidence (old riverbeds, paintings of water-loving animals) contradicts the common picture in the first sentence, so the transition is a contrast: *yet*. “Moreover” and “similarly” would add to or extend the first sentence instead. “Thus” would make the evidence follow from people’s assumption.

25. C. “Why useful” calls for the reason: the same text appears in a script scholars could read. C states it. A and B give dates, and D names the scripts without saying why that mattered.

26. B. B contrasts the seasons directly. A uses a contrast word (“unlike”) to introduce something both species share. C contrasts breeding *location*, not season. D gives only one species.

27. D. A reason needs a cause linked to the result: summarizing in their own words → better conceptual scores. B flips which group scored higher. C gives the result without a reason, and A gives only the study’s question.

Reading and Writing, Module 2

1. B. The blank is the critics’ label, which the text says is a misreading. What do the critics see? Shifts that “seem careless”: *haphazard*. *Meticulous* is the writer’s actual method, the view the text defends, not the critics’ view. Careful reading of whose word it is decides this one.

2. A. “Although ... 15 percent higher” raises the expectation that the model rejects the old figures. “Not so much X as refine” denies that expectation, so X is the stronger move: *overturn*. *Replicate* doesn’t fit a result that differs by 15 percent, and *inflate* implies distortion, which the careful correction contradicts.

3. D. Corinne expected meagerness, and the species count was low, but the plants themselves grew larger and bolder. Isolation didn’t shrink them; it freed them: not *diminished* but “given license.” *Multiplied* contradicts “a hundred-odd species.” *Protected* doesn’t contrast with license the way the sentence requires.

4. C. Several causes, each weighed against the others, describe an account with many sides: *multifaceted*. *Cursory* (hasty, shallow) contradicts the careful weighing. Nothing suggests bias (*partisan*) or copying (*derivative*); she departs from “many accounts.”

5. A. The sentence points out a flaw in puzzle-box tests (they penalize birds wary of new objects), and “therefore” shows Okafor’s familiar-material tasks respond to it. It doesn’t report a result (B, D), and nothing compares difficulty (C).

6. D. First sentence: the usual emphasis (social effects). Second: Reyes, who accepts those effects, argues the technical legacy lasted longer. B reverses the order and the focus. A misreads Reyes’s “does not dispute” as a contradiction, and C invents a second historian.

7. B. Natarajan calls the two lineages “well established” but says one domestication plus interbreeding would produce the same pattern, so the data can’t decide. That’s B. A contradicts her acceptance of the lineages. D is the subtle trap: she says the two scenarios *cannot be told apart*, not that hers is better.

8. A. The main idea holds both halves: moderate past heat seemed protective, severe past bleaching didn’t (it may have hurt). B drops Kaleo’s caution. C reverses it. D is a background detail from the first two sentences.

9. C. The last sentence lays out the bind: each version keeps meaning *or* rhythm, never both. B is contradicted (“Its meaning was not the problem”). A narrows the problem to two words, though the issue is the fall across the whole sentence. D isn’t suggested by an eleven-word sentence.

10. B. B holds internet access constant and still finds the decline tracking cuts at the papers themselves, which points to the newspapers’ own changes and against online news as the main cause. A and C fit the hypothesis (they support it). D is about national papers, a different question.

11. B. The claim is a comparison: objects beat photographs at calling up memory. B makes it: the glasses bring back his voice “more surely than any picture.” C lists objects but makes no comparison and recalls nothing. D praises photographs, the opposite emphasis. A mentions photographs but not objects.

12. D. “Warming” means the evidence must show what happens as temperature rises. D does: similar at 10°C, a wide gap at 20°C as bull kelp slows. C shows a 0.2 cm advantage at a middle temperature, too small and too partial to carry the claim. A favors bull kelp. B is about one species only.

13. B. The claim compares two species against the ice-out trend. B shows all three lines: ice-out and swallows shifting together by similar amounts, warblers flat. A and C are accurate comparisons that don’t address *change over time*. D describes ice-out alone.

14. B. Barley shows up in fermentation residues long before it becomes a regular food crop, so its earliest use there may have been for brewing. A contradicts the later arrival as a food crop. C contradicts the fermentation evidence. D has no support.

15. C. If food alone shrank home ranges, the heavily fed foxes should have small ranges too, and they didn’t. So something else about gardens (shelter, cover) is the likelier cause. B is ruled out by the last clause: fed foxes got *more* food from people. A turns “no smaller” into “larger.” D has no support.

16. D. The subject is *Ada Lovelace*; after the appositive and the “who” clause (which describes Byron), the sentence still needs its main verb. Only *wrote* is finite.

17. A. “Sea otters ... wrap themselves” is the main clause, so the phrase after the comma is a modifier telling what the wrapping does, and it takes the -ing form. B is a comma splice. C is a finite verb with no subject. D’s perfect infinitive puts the action in the wrong time.

18. C. “However” begins the second of two complete clauses, so the clauses need a semicolon before it, with a comma after it. A and D splice the clauses with commas; B has no boundary punctuation.

19. D. “The number of” is singular (one number), so the verb is singular: *is*. “Languages” is the object of the preposition. (Compare “a number of languages *are*.”)

20. C. The subject is the long phrase “The tiny ... spines that cover the surface of a cat’s tongue,” and its verb is “help.” No punctuation goes between a subject and its verb, however long the subject. A, B, and D all split them.

21. A. The rearranging was finished before the visitors discovered it in 2022, so it takes the past perfect: *had rearranged*. B and D are present tense, and C future, for a past event.

22. A. The appositive (“the tallest tree species on Earth”) interrupts the subject and its verb, so it needs matching punctuation on both sides: two dashes. B and C mix a comma with a dash. D omits the opening punctuation.

23. C. Having given up on lenses, Newton used a mirror in their place: *instead*. “Nevertheless” would mean he built the mirror telescope despite concluding lenses couldn’t work, which gets the logic backward; the conclusion is his reason for the mirror.

24. D. The statistics cut against the hoax conclusion, so the transition must signal contrast: *still* (meaning “even so”). “Accordingly” and “likewise” treat the evidence as agreeing with the hoax theory. “For instance” makes it an example of it.

25. C. C states the shared feature: solar alignment at the solstices. B opens with “Like,” a similarity word, but its actual content is a difference in dates. A and D are differences outright.

26. A. The goal asks for two benefits. A gives both. B gives one benefit plus a fact about evolution. C reverses the second benefit (caffeine *slows* nearby seedlings). D gives no benefit at all.

27. D. The surprise is the mismatch between a small brain (which suggested great age) and a young date. D states both and says it was unexpected. A uses “surprisingly” about the location, which wasn’t the surprise. B gives the date without the expectation it overturned. C misreports the notes: the million-year figure was an assumption, not the dating result.

Math, Module 1

1. D. $\frac{3x}{4} = 9$, so $3x = 36$. Choice A is x itself.

2. B. $\frac{5}{2} = \frac{350}{s}$, so $s = 140$. Choice D flips the ratio ($350 \times \frac{5}{2}$).

3. A. 12 multiplies h , so each additional hour adds \$12: the hourly rate. The fixed fee is 15; the cost for one hour is $12 + 15 = 27$.

4. 105. $B + C = 180 - 40 = 140$ and $B = 3C$, so $4C = 140$, $C = 35$, and $B = 105$. Stopping at $C = 35$ answers the wrong question.

5. B. After m months, $\frac{m}{12}$ years have passed, and the yearly factor is 0.85: $28,000(0.85)^{m/12}$. Choice A applies the yearly drop every month. Choice C splits 15% into twelve equal monthly cuts, which doesn’t compound to 15% a year. Choice D uses the rate of decrease as the factor.

6. 5. Adding the equations eliminates y : $4x = 16$, so $x = 4$. Then $4 + 2y = 14$ and $y = 5$.

7. D. The total goes from $9(20) = 180$ to $10(22) = 220$, so the new number is 40. Choice A assumes the new number equals the new mean.

8. -4. The vertex is at $x = \frac{8}{2} = 4$, and $f(4) = 16 - 32 + 12 = -4$. Giving 4 answers with the x -coordinate.

9. D. $30 + 0.10(t - 200) \leq 45$ gives $t - 200 \leq 150$, so $t \leq 350$. Choice A is the number of *extra* texts; the first 200 are free.

10. C. $r^2 = (4 - (-2))^2 + (-3 - 5)^2 = 36 + 64 = 100$. Center $(-2, 5)$ gives $(x + 2)^2 + (y - 5)^2$. Choices A and D flip the signs of the center; B and D use r in place of r^2 .

11. 84. The rate is $150 \div 2.5 = 60$ miles per hour, which is 1 mile per minute, so 84 miles takes 84 minutes. In hours the answer would be 1.4, but the question asks for minutes.

12. A. $x + 3 = 4(x - 2) = 4x - 8$, so $3x = 11$ and $x = \frac{11}{3}$. Choice B forgets to multiply the -2 by 4.

13. D. With $s = \ell + 3$: $4(\ell + 3) + 5\ell = 66$, so $9\ell = 54$ and $\ell = 6$; then $s = 9$. Total: 15. Choices A and B are the counts of one size each.

14. A. Factor: $\frac{(x - 3)(x + 3)}{(x + 3)(x - 2)} = \frac{x - 3}{x - 2}$. Choice D “cancels” x^2 terms, which isn’t allowed across addition.

15. B. $\frac{10}{20} \cdot \frac{9}{19} = \frac{90}{380} = \frac{9}{38}$. Choice A treats the draws as if the first marble were put back. Choice D removes a green marble from the numerator but not from the total.

16. C. $8^{x-1} = 2^{3(x-1)} = 2^{3x-3}$. Setting exponents equal: $x + 3 = 3x - 3$, so $x = 3$. Forgetting to distribute the 3 gives $x + 3 = 3x - 1$, so $x = 2$ (choice B).

17. C. For complementary angles, $\sin(90^\circ - \theta) = \cos \theta = 0.28$. Choice B is $\sin \theta = \sqrt{1 - 0.28^2} = 0.96$, which answers a different question.

18. C. Set $y = 0$: $(x - 3)^2 = 16$, so $x = -1$ or $x = 7$, which are 8 apart. Choice A is the distance from the axis of symmetry to one intercept.

19. A. Rate: $\frac{27 - 12}{10 - 4} = 2.5$ cm per day. Back up 4 days from day 4: $12 - 4(2.5) = 2$. Choice B is the growth rate, not the starting height.

20. 126. Let the width be w : $2(w + 2w + 4) = 50$, so $3w + 4 = 25$ and $w = 7$. The length is 18, and the area is $7 \times 18 = 126$.

21. 18. One solution means the discriminant is zero: $(-12)^2 - 4(2)(c) = 144 - 8c = 0$, so $c = 18$.

22. B. $g(x) = f(x - 3)$ is f shifted right 3, so f ’s vertex is at $x = 5 - 3 = 2$. Then $-\frac{b}{2} = 2$ and $b = -4$. Choice A shifts the wrong way (vertex at 8). Choice D ignores the shift (vertex at 5).

Math, Module 2

1. 6. The left side is $4x - 6$, so $4x - 6 = 4x - k$ for all x means $k = 6$.

2. B. $3x - 4y = 12$ has slope $\frac{3}{4}$. Then $y + 1 = \frac{3}{4}(x - 2)$ gives $y = \frac{3}{4}x - \frac{5}{2}$. Choice A is the other line’s intercept; choice D uses slope $-\frac{3}{4}$.

3. D. The solutions add to 6 (sum $= -\frac{b}{a}$). With $r + (r + 4) = 6$, $r = 1$, so the solutions are 1 and 5, and k is their product: 5. Choice C gives a single repeated root.

4. A. An inscribed angle is half its arc’s central angle, so the central angle is 70° . Arc length: $\frac{70}{360} \cdot 2\pi(18) = 7\pi$. Choice B uses 35° as the central angle.

5. 42.9. Bus riders: $0.4(25,000) = 10,000$, then 12,000. Population: 28,000. $\frac{12,000}{28,000} \approx 42.86\%$, or 42.9. Adding $40\% + 20\%$ or computing $40\% \times 1.2 = 48\%$ ignores the population growth.

6. A. $p(-2) = -8 + 4a + 8 - 12 = 0$ gives $a = 3$. Then $p(x) = x^2(x + 3) - 4(x + 3) = (x + 3)(x - 2)(x + 2)$, with zeros $-3, -2, 2$. Their sum is -3 . (For a cubic with leading coefficient 1, the sum is $-a$.) Choice B is a .

7. C. Infinitely many solutions means the first equation is a multiple of the second. Constants: $12 = \frac{3}{2} \cdot 8$, so the multiplier is $\frac{3}{2}$. Then $a = \frac{3}{2} \cdot 2 = 3$ and $3 = \frac{3}{2}b$, so $b = 2$. $a + b = 5$.

8. D. Net rate: $3.5 - 1.2 = 2.3$ gallons per minute. Remaining: $200 - 40 = 160$ gallons. $160 \div 2.3 \approx 69.6$, or 70 minutes. Choice A ignores the drain; choice C ignores the 40 gallons already in the tank.

9. C. Volumes of similar solids scale by the cube of the scale factor: $64\pi \times 1.5^3 = 64\pi \times 3.375 = 216\pi$. Choice A scales linearly and B by the square.

10. C. The exponent $4t$ counts quarter-years, so the factor 1.02 applies every three months: a 2% increase per quarter. The yearly factor is $1.02^4 \approx 1.0824$, about 8.24% per year, which is why B (simply $4 \times 2\%$) and D (the yearly rate attached to the wrong period) both miss.

11. -9. Cross-multiply: $5(x + 3) = 3(x - 1)$, so $5x + 15 = 3x - 3$ and $x = -9$. Neither denominator is zero at -9 , so it stands.

12. B. Random assignment supports a causal conclusion; using volunteers limits it to people like them. A overgeneralizes to all adults. C ignores that the groups were assigned randomly, not chosen. D is wrong: random assignment is exactly what lets a sample support cause.

13. 4. Set equal: $2x^2 - kx + 2 = 0$. One intersection needs a zero discriminant: $k^2 - 16 = 0$, so $k = \pm 4$. The single solution is $x = \frac{k}{4}$, which is positive only when $k = 4$.

14. B. In the third quadrant both sine and cosine are negative, so $\cos \theta = -\frac{12}{13}$ and $\tan \theta = \frac{-5/13}{-12/13} = \frac{5}{12}$.

Choice A gets the sign wrong; C and D invert the ratio.

15. D. $g(3) = f(6) + 1 = 10 + 1 = 11$. Choice A uses $f(3) + 1$, forgetting to double the input. Choice C doubles the output instead: $2f(6) + 1$.

16. A. To maximize graphing calculators, buy the fewest basic ones: $40 - g$. Then $18(40 - g) + 95g \leq 2,000$, so $77g \leq 1,280$ and $g \leq 16.6$. The answer is 16. Choice D spends the whole budget on graphing calculators and ignores the 40-calculator requirement; B rounds up past the limit.

17. 100. $p(0.80)(1.08) = 0.864p = 86.40$, so $p = 100$. Adding and subtracting the percents ($p \times 0.88$) gives a wrong answer.

18. B. Square: $x + 7 = x^2 - 10x + 25$, so $x^2 - 11x + 18 = 0$ and $x = 2$ or $x = 9$. Check: at $x = 9$, $\sqrt{16} = 4 = 9 - 5$. At $x = 2$, $\sqrt{9} = 3$ but $2 - 5 = -3$, so 2 is extraneous. Choice C keeps it.

19. D. The square's diagonal is the diameter, 12, so its area is $\frac{12^2}{2} = 72$. The circle's area is 36π . Shaded: $36\pi - 72$. Choice A uses 12^2 as the square's area, as if its *side* were 12.

20. 10. The zeros give $f(x) = a(x + 1)(x - 3)$. Then $f(1) = a(2)(-2) = -4a = -8$, so $a = 2$, and $f(4) = 2(5)(1) = 10$.

21. C. $82(18) + 87n = 84(18 + n)$ gives $1,476 + 87n = 1,512 + 84n$, so $3n = 36$ and $n = 12$.

22. A. $f(0) = a(2)(-6) = -12a = -6$, so $a = \frac{1}{2}$. The vertex is midway between the zeros, at $x = 2$: $f(2) = \frac{1}{2}(4)(-4) = -8$. Choice B is the y -intercept, not the minimum.