



SAT Practice Test 1

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** Marine biologist Anaïs Ferrero spent three field seasons cataloging the courtship displays of cuttlefish off the coast of Portugal. Her resulting monograph is notably _____.: rather than summarizing general patterns, it records each of the 1,140 displays she observed individually, noting the water temperature, the time of day, and the posture of every animal involved.

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

- (A) speculative
- (B) exhaustive
- (C) provisional
- (D) derivative

- 2** The economist's critics claim that her model of rural credit markets ignores informal lending among relatives. But this charge is difficult to _____.: the model's second chapter devotes forty pages to exactly such lending, treating it as the main competitor to bank loans.

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

- (A) dismiss
- (B) sustain
- (C) quantify
- (D) anticipate

- 3** The following text is from a novel. Delia has just inherited her grandmother's orchard.

The trees had not been pruned in a decade, and their branches crossed and recrossed overhead until the rows seemed less like an orchard than a thicket. Still, Delia found she could not regard the place as a burden. Each gnarled limb, she thought, kept a kind of record, and she meant to read it before she cut a single one.

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

- (A) Admire
- (B) Observe
- (C) Honor
- (D) Consider

- 4** For decades, climatologists treated the weather diaries kept by nineteenth-century farmers as _____ sources: charming records of daily life, perhaps, but too inconsistent to support serious analysis. Hydrologist Mireille Okafor's recent reconstruction of regional rainfall, which agrees closely with independent tree-ring data, relies almost entirely on such diaries.

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

- (A) authoritative
- (B) contemporaneous
- (C) anecdotal
- (D) indispensable

- 5 The following text is from a novel. Tomas, a junior clerk, is waiting outside his employer's office.

Tomas had rehearsed the speech so many times that the words had worn smooth, like stones in a creek. He would explain the error in the ledger, accept the blame that was his, and decline the blame that was not. Then the door opened, and Mr. Hale, smiling as though nothing at all were the matter, asked whether Tomas would care for some tea. Every sentence Tomas had prepared slipped out of reach.

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

- (A) It introduces a development that disrupts the plan described in the previous sentences.
- (B) It reveals that Tomas has misjudged how serious the error in the ledger is.
- (C) It explains why Tomas felt compelled to rehearse his speech so many times.
- (D) It establishes that Mr. Hale is unaware that an error was made.

- 6 Many flowering plants depend on insects for pollination, and botanists have generally assumed that a flower's scent evolves to attract its pollinators. A study led by Kenji Arakawa complicates that assumption. In a wild population of evening primrose, Arakawa's team found that the compounds that made flowers most attractive to pollinating moths also drew beetles that chewed the petals. Plants with fainter scents attracted fewer pollinators but suffered far less damage, suggesting that floral scent may reflect a compromise between competing pressures rather than an adaptation to pollinators alone.

Which choice best describes the overall structure of the text?

- (A) It describes a scientific debate, evaluates the evidence on each side, and concludes that the debate cannot yet be resolved.
- (B) It presents a widely held view, describes a finding that challenges that view, and offers an alternative interpretation.
- (C) It introduces a hypothesis, explains how researchers tested it, and reports that the results confirmed it.
- (D) It identifies a problem facing plant conservation, proposes a solution, and notes a limitation of that solution.

7

The lomas, or fog oases, of Chile's Atacama Desert are among the most unusual ecosystems on Earth. Rain almost never falls there; instead, the plants of the lomas draw nearly all their water from a thick coastal fog known as *camanchaca*. The relationship is precarious: a shift of only a few hundred meters in the elevation at which the fog bank forms can leave an entire hillside of vegetation without moisture for a season.

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

- (A) It explains how the plants of the lomas extract moisture from the fog.
- (B) It identifies the main reason rain rarely falls in the Atacama Desert.
- (C) It contrasts the lomas with other ecosystems that depend on fog.
- (D) It illustrates the precariousness of the relationship mentioned earlier in the sentence.

8

Text 1

Many urban planners argue that converting downtown parking garages into housing would ease housing shortages in midsize cities. Because garages already have foundations, utility connections, and structural frames, the planners contend, conversion costs far less than new construction.

Text 2

Garage conversion is appealing in theory, but in practice the structures resist it. Most garages have low ceilings and sloped floors designed to move cars, not people, and their deep, windowless interiors fail building codes requiring natural light in bedrooms. Engineer Sun-hee Park found that in nine of the twelve conversions she studied, so much of the frame had to be modified that the savings over new construction were negligible.

Based on the texts, how would Park (Text 2) most likely respond to the planners' contention in Text 1?

- (A) She would agree that conversion costs less than new construction but question whether the resulting housing would be affordable.
- (B) She would suggest that the planners have underestimated the demand for housing in midsize cities.
- (C) She would contend that garages should be demolished rather than modified, since demolition is the least expensive option.
- (D) She would argue that the cost advantage the planners cite often disappears once necessary modifications are made.

9 The following text is from a novel.

Marguerite had always been the one who left. She had left the village at seventeen for the city, the city at twenty-five for the coast, and the coast, eventually, for a string of rented rooms whose addresses she could no longer recall. Now, returning for her brother's wedding, she found the village's single street unchanged, and the sight unsettled her more than any of her departures had. It was as though the place had been waiting, patiently and without reproach, for her to notice that she had never really been anywhere at all.

Which choice best states the main idea of the text?

- (A) Marguerite's return to an unchanged village prompts her to reconsider what her many departures amounted to.
- (B) Marguerite regrets leaving the village and resolves to return there permanently.
- (C) Marguerite resents her family for remaining in the village while she pursued opportunities elsewhere.
- (D) Marguerite is surprised to discover how much the village has changed since she left it.

10 Geologist Ifeoma Nwosu studies rock varnish, a thin dark coating that forms on exposed rocks in deserts. The varnish is rich in manganese, an element that is scarce in the surrounding dust. For decades, researchers proposed that microbes living on rock surfaces concentrate manganese from the dust. Nwosu's analysis suggests another source: in samples from three deserts, the manganese in the varnish occurred in a chemical form that is produced when sunlight reacts with manganese dissolved in dew, a process requiring no biological activity at all.

According to the text, what did Nwosu's analysis suggest?

- (A) The manganese in rock varnish may be concentrated by a nonbiological process involving dew and sunlight.
- (B) Microbes on rock surfaces are more common in some deserts than in others.
- (C) Rock varnish contains less manganese than researchers had previously assumed.
- (D) Dust in desert environments is the main source of the dew that forms on rocks.

11 In a poem about walking along a beach at low tide, the speaker conveys a sense that the shoreline is changing even as she watches it.

Which quotation from the poem most effectively illustrates this claim?

- (A) "The gulls have settled, gray on grayer stone,"
- (B) "I came to find the place my father showed me years ago,"
- (C) "and every footprint I have left is filling, slowly, from beneath,"
- (D) "the harbor lights are cold and far and few."

12

Biologist Laila Haddad hypothesizes that young zebra finches learn songs more accurately from a live adult tutor than from recordings because live tutors adjust their singing in response to the young bird's behavior.

Which finding, if true, would most directly support Haddad's hypothesis?

- (A) Young finches exposed to recordings sang more often than young finches exposed to live tutors.
- (B) Adult zebra finches sing the same song in the same way regardless of whether a young bird is present.
- (C) Young finches exposed to live tutors produced more accurate copies of the tutors' songs than young finches exposed to recordings did, but only when the tutors could see the young birds.
- (D) Young finches exposed to both live tutors and recordings learned songs more slowly than young finches exposed to either alone.

13

Mean Corn Yield (bushels per acre)

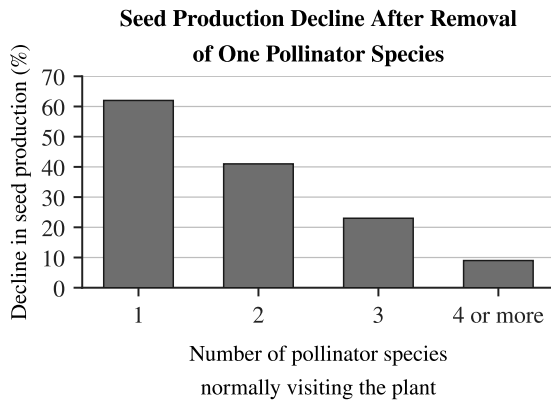
Year	Without clover	With clover
1	162	158
2	160	167
3	159	174

Agricultural scientist Rosa Vélez tested whether planting a cover crop of clover between rows of corn affects corn yield. The table shows mean yields from plots with and without clover over three years. Vélez concluded that the benefit of clover to corn yield increases over time.

Which choice most effectively uses data from the table to support Vélez's conclusion?

- (A) Plots with clover had a mean yield 4 bushels per acre lower than plots without clover in year 1 but 15 bushels per acre higher in year 3.
- (B) In each of the three years, plots with clover produced higher mean yields than plots without clover did.
- (C) The mean yield of plots without clover declined slightly from year 1 to year 3.
- (D) The mean yield of plots with clover was 174 bushels per acre in year 3.

14



Botanist Nadia Ferreira removed one pollinator species from experimental plots and measured the resulting decline in seed production for plants that are normally visited by different numbers of pollinator species. She concluded that plants pollinated by many species are more resilient to the loss of a single pollinator than plants pollinated by few species are.

Which choice best describes data from the graph that support Ferreira's conclusion?

- (A) Plants pollinated by one species showed a smaller decline in seed production than plants pollinated by four or more species did.
- (B) As the number of pollinator species increased, the decline in seed production after the removal of one pollinator species increased.
- (C) Plants pollinated by two species and plants pollinated by three species showed nearly the same decline in seed production.
- (D) As the number of pollinator species increased, the decline in seed production after the removal of one pollinator species decreased.

15

Archaeologists excavating a ninth-century trading settlement on the Baltic coast found thousands of glass beads. Chemical analysis showed that the glass in most of the beads originated in the eastern Mediterranean, yet the beads were found alongside crucibles, glass scraps, and half-formed beads. Since raw glass was rarely shipped long distances in this period, whereas finished glass objects were traded widely, these findings suggest that _____

Which choice most logically completes the text?

- (A) the beads found at the settlement were manufactured in the eastern Mediterranean and shipped to the Baltic coast.
- (B) the settlement's artisans obtained imported glass objects and melted them down to make beads.
- (C) artisans at the settlement produced glass from local materials using techniques learned from Mediterranean traders.
- (D) glass beads were more valuable on the Baltic coast than they were in the eastern Mediterranean.

- 16** In many songbird species, individuals that arrive earliest in spring claim the best breeding territories. Ornithologist Priya Raman noticed that in one population of warblers, the earliest-arriving males were mostly birds that researchers had fitted with lightweight tracking tags the previous year. Raman suspects that the tags did not cause the early arrivals; rather, researchers had tagged only birds that were already in unusually good physical condition. If Raman is correct, then _____

Which choice most logically completes the text?

- (A) tagged and untagged males in similar physical condition would be expected to arrive at about the same time.
- (B) the tags help birds navigate more efficiently during migration.
- (C) untagged males arrived late because they were unable to find suitable breeding territories.
- (D) researchers should avoid tagging birds that are in good physical condition.

- 17** Glaciologist Ana Ruiz drills ice cores high in the Andes. To her, each core is a vertical _____ layers preserve snow that fell centuries before the snow in the layers above them.

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

- (A) archive, deeper
- (B) archive deeper
- (C) archive; and deeper
- (D) archive: deeper

- 18** The tardigrade, a microscopic animal able to survive near-total dehydration, _____ its cells with a protein that hardens into a glasslike gel, a strategy that protects delicate molecular structures until water returns.

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

- (A) shielding
- (B) shields
- (C) to shield
- (D) having shielded

- 19** The collection of letters exchanged between the two astronomers, which scholars recovered from an attic in Leiden in 2009, _____ how the pair disagreed about the nature of sunspots for nearly two decades.

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

- (A) reveal
- (B) reveals
- (C) have revealed
- (D) are revealing

- 20** Physicist Hana Lindqvist's 2011 _____ that tiny swirls of magnetism could store data far more densely than conventional hard drives, prompted a decade of experiments.

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

- (A) paper which proposed
- (B) paper; which proposed
- (C) paper, which proposed
- (D) paper: which proposed

- 21** In the coastal town of Ilha Verde, the fishing cooperative pools _____ catches each morning, and members divide the proceeds according to the hours each has worked.

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

- (A) its members
- (B) it's members'
- (C) its members'
- (D) their member's

- 22** Trained as a structural engineer before turning to sculpture, _____

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

- (A) Odile Marchand designs large steel works that seem almost weightless despite their mass.
- (B) the large steel works of Odile Marchand seem almost weightless despite their mass.
- (C) Odile Marchand's large steel works seem almost weightless despite their mass.
- (D) there is an almost weightless quality to the large steel works designed by Odile Marchand.

- 23** In the early twentieth century, many critics dismissed photography as a mechanical process, unworthy of comparison with painting. Photographer Lena Brandt set out to refute this view. _____ despite relying on the same cameras and lenses as her contemporaries, Brandt cultivated a soft-focus style and painterly compositions that invited direct comparison with Impressionist canvases.

Which choice completes the text with the most logical transition?

- (A) Nevertheless,
- (B) Even so,
- (C) Instead,
- (D) To that end,

- 24** Most hummingbirds defend feeding territories aggressively, chasing away rivals that approach their flowers. The long-billed hermit, however, rarely defends territory at all. _____ it follows a fixed circuit, or “trapline,” visiting widely scattered flowers in the same order each day, much as a trapper checks a line of traps.

Which choice completes the text with the most logical transition?

- (A) Similarly,
- (B) Consequently,
- (C) Instead,
- (D) Furthermore,

25

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

- Mangroves and salt marshes are both coastal wetlands that store large amounts of carbon.
- Mangroves are forests of salt-tolerant trees found mainly in tropical and subtropical regions.
- Salt marshes are dominated by grasses and other low-growing plants and are found mainly in temperate regions.
- Both ecosystems trap carbon-rich sediment carried in by tides.
- Mangroves store much of their carbon in woody roots and trunks; salt marshes store most of theirs in soil.

The student wants to emphasize a difference in how mangroves and salt marshes store carbon. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- (A) Whereas mangroves store much of their carbon in woody roots and trunks, salt marshes store most of theirs in soil.
- (B) Unlike forests on land, mangroves and salt marshes both trap carbon-rich sediment carried in by tides.
- (C) Mangroves are found mainly in tropical and subtropical regions, while salt marshes are found mainly in temperate regions.
- (D) In contrast to many other ecosystems, mangroves and salt marshes are both coastal wetlands that store large amounts of carbon.

26

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

- Bioluminescent bays glow when the water is disturbed because of dinoflagellates, single-celled organisms that emit light.
- Researcher Marisol Cortés wanted to know whether light pollution from coastal development dims the bays' glow.
- She measured glow intensity in three bays on nights with and without nearby artificial lighting.
- She also counted dinoflagellate concentrations in water samples from each bay.
- Glow intensity was 35% lower on artificially lit nights, but dinoflagellate concentrations were unchanged.

The student wants to describe how Cortés conducted her study. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- (A) Cortés found that glow intensity was 35% lower on artificially lit nights, though dinoflagellate concentrations did not change.
- (B) To learn whether artificial light dims the bays' glow, Cortés measured glow intensity in three bays on nights with and without nearby lighting and counted dinoflagellates in water samples.
- (C) Bioluminescent bays glow because of dinoflagellates, single-celled organisms that emit light when the water is disturbed.
- (D) Coastal development may threaten bioluminescent bays, a concern that led Cortés to study them.

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

- Mount Tambora, a volcano in Indonesia, erupted in April 1815.
- The eruption ejected an estimated 150 cubic kilometers of material.
- Sulfate aerosols from the eruption reflected sunlight, lowering average global temperatures by roughly 0.4–0.7°C.
- 1816 became known in Europe and North America as “the Year Without a Summer.”
- Crop failures that year contributed to food shortages across the Northern Hemisphere.

The student wants to explain a cause of the food shortages of 1816 to an audience unfamiliar with Mount Tambora. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- (A) Mount Tambora's 1815 eruption ejected an estimated 150 cubic kilometers of material.
- (B) In 1816, “the Year Without a Summer,” crop failures contributed to food shortages across the Northern Hemisphere.
- (C) The April 1815 eruption of Mount Tambora, an Indonesian volcano, released sulfate aerosols that cooled the planet, contributing to the crop failures and food shortages of 1816.
- (D) Mount Tambora released sulfate aerosols that reflected sunlight, lowering average global temperatures.

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** Although the novelist's early reviewers praised her prose as luminous, their admiration was often _____.: nearly every review that celebrated her sentences went on to complain that her plots were thin and her characters forgettable.

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

- (A) qualified
- (B) feigned
- (C) unanimous
- (D) belated

- 2** Some historians of science portray the nineteenth-century debate over the age of Earth as a clash between rigorous physicists and _____ geologists. But the geologists' estimates, drawn from careful measurements of sedimentation rates, were hardly the product of guesswork; if anything, it was the physicists' calculations, which assumed that Earth had no internal source of heat, that rested on a shaky premise.

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

- (A) dilatory
- (B) parochial
- (C) cavalier
- (D) obstinate

- 3** The following text is from a novel. Ines has just arrived at the house her family is renting for the summer.

The house on Cedar Lane was spare in the way of houses whose owners have moved often: a table, four chairs, a shelf of books whose spines had never been cracked. Nothing in it, Ines thought, had been chosen to be loved, only to be carried.

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

- (A) Surplus
- (B) Merciful
- (C) Slender
- (D) Austere

- 4** Linguist Mehdi Sadeghi argues that the sudden disappearance of a grammatical feature from a language's written record need not mean that the feature vanished from speech. Writers, he notes, often _____ forms they regard as informal, so a feature may survive for generations in conversation while leaving almost no trace on the page.

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

- (A) proliferate
- (B) eschew
- (C) misconstrue
- (D) revive

5 Sociologist Yara Castellanos studied why some neighborhood associations persist for decades while others dissolve within a few years. Conventional explanations emphasize resources: associations with more funding and paid staff should last longer. Castellanos found that funding mattered surprisingly little. Of the forty associations she followed, several of the longest-lived had never had a budget larger than a few hundred dollars, while some of the best funded collapsed after a single contentious election. What distinguished durable associations, she concluded, was a practice of rotating leadership roles so that no single member became indispensable.

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

- (A) It provides evidence for Castellanos's finding that funding was not a strong predictor of an association's longevity.
- (B) It introduces the factor that Castellanos ultimately identified as the main cause of associations' durability.
- (C) It describes an exception to a pattern that Castellanos observed in most of the associations she studied.
- (D) It explains why conventional explanations of associations' durability emphasize resources.

6 The following text is from a poem.

My mother kept her recipes in no book.
She measured flour by the heft of her palm,
salt by a pinch she could not name in spoons,
and when I asked her how much water, she
said
until it looks right, which is to say
she gave me everything except the part
I'd need to make it look right on my own.

Which choice best describes the overall purpose of the text?

- (A) To suggest that the speaker's mother's way of cooking resists being passed on through instruction alone
- (B) To criticize the speaker's mother for refusing to share her recipes with the speaker
- (C) To celebrate the speaker's success in learning to cook without written recipes
- (D) To contrast the precision of written recipes with the carelessness of cooking by feel

7 In 2019 a team led by astronomer Felipe Arancibia reported that a distant galaxy appeared to contain almost no dark matter, a finding that, if confirmed, would challenge models in which galaxies form only within halos of dark matter. Skeptics argued that the team had misjudged the galaxy's distance, an error that would distort estimates of its mass. Arancibia's team responded by measuring the distance with a second, independent method. The new measurement closely matched the original one, though the team acknowledged that a third method, not yet feasible with current telescopes, would be needed to settle the question.

Which choice best describes the overall structure of the text?

- (A) It describes a theory of galaxy formation, presents evidence supporting that theory, and explains why skeptics nonetheless reject it.
- (B) It presents two competing measurements, evaluates the methods behind each, and concludes that one is more reliable.
- (C) It describes a surprising claim, presents an objection to that claim, explains how the claim's proponents addressed the objection, and notes a remaining limitation.
- (D) It describes a finding, explains why the finding was later retracted, and proposes a method for future research.

8 **Text 1**
Economists have long observed that people value a good more once they own it, a pattern called the endowment effect. In classic experiments, participants given a mug demanded roughly twice as much to sell it as other participants were willing to pay to buy an identical mug. Many economists treat this gap as evidence of a deep-seated psychological bias rooted in an aversion to losses.

Text 2
Psychologist Dana Whitlock argues that the mug experiments may reveal as much about the experimental setting as about human nature. When she replicated the classic design but told participants beforehand that trading was routine and expected, the gap between selling and buying prices shrank by more than half. Participants, Whitlock suggests, may have interpreted an unexplained gift as something the experimenter wanted them to keep.

Based on the texts, how would Whitlock (Text 2) most likely respond to the “many economists” in Text 1?

- (A) She would agree that the endowment effect reflects a deep-seated bias but argue that the bias is weaker for inexpensive goods such as mugs.
- (B) She would contend that the gap between selling and buying prices does not appear in experiments involving goods other than mugs.
- (C) She would argue that the price gap they cite may partly reflect how participants interpreted the experiment rather than a fundamental psychological bias.
- (D) She would claim that an aversion to losses explains her own results better than it explains the results of the classic experiments.

9

Text 1

Historians of the medieval book trade have usually inferred the size of a scribal workshop from the number of distinct handwriting styles, or “hands,” in its surviving manuscripts: five hands, five scribes. Codicologist Agnes Varga argues that this method systematically inflates estimates of workshop size. Scribes, she notes, routinely altered their letterforms when switching between languages or between formal and informal texts, so a single scribe could easily account for several apparent hands.

Text 2

A recent study of a fifteenth-century workshop in Bruges counted eleven distinct hands across the workshop's forty surviving manuscripts and concluded that it employed at least eleven scribes at its height. Notably, all forty manuscripts are formal Latin texts of the same genre, copied over a span of only six years.

Based on the texts, how would Varga (Text 1) most likely respond to the study described in Text 2?

- (A) She would argue that the study's conclusion is likely inflated, since the eleven hands could belong to far fewer scribes.
- (B) She would contend that eleven scribes is an implausibly large number for a workshop of that period.
- (C) She would argue that the study should have counted manuscripts rather than handwriting styles.
- (D) She would suggest that features of the Bruges manuscripts make the study's conclusion less vulnerable to her usual objection.

10

Urban ecologists have documented that many bird species sing at higher pitches in cities than members of the same species do in rural areas, a shift usually explained as a response to low-frequency traffic noise. But ecologist Kwame Asante points out that cities differ from forests in more than noise: dense buildings reflect sound, and hard surfaces carry high frequencies farther than leaf-covered ground does. In a study of great tits in twelve European cities, Asante found that song pitch was more strongly associated with the density of tall buildings than with traffic noise levels, suggesting that the acoustic structure of the urban environment, and not merely its loudness, may shape birdsong.

Which choice best states the main idea of the text?

- (A) Asante's research shows that traffic noise has no effect on the pitch of urban birdsong.
- (B) Great tits in cities sing at higher pitches than great tits in forests because buildings block low-frequency sounds.
- (C) Urban ecologists have overestimated the amount of traffic noise in European cities.
- (D) Asante's research suggests that a commonly accepted explanation for higher-pitched urban birdsong may be incomplete.

11

Paleontologist Hye-jin Moon hypothesizes that the long tail feathers of a small feathered dinosaur found in Cretaceous deposits in China were used in courtship displays rather than for stability during running or gliding. Moon notes that in living birds, display feathers typically appear only once individuals reach sexual maturity.

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

- (A) The species' tail feathers were too short relative to its body to provide meaningful stability.
- (B) Some fossils of the species show tail feathers with pigment patterns resembling those of display feathers in living birds.
- (C) Fossils of juveniles and adults of the species show long tail feathers of similar proportions.
- (D) Other feathered dinosaurs from the same deposits had shorter tail feathers.

12

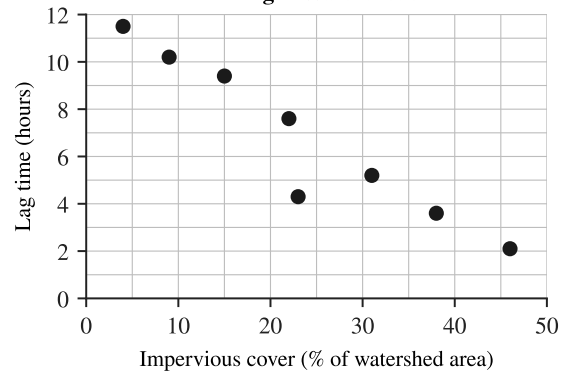
In a novel, the narrator describes her aunt Beatrix as a person whose generosity always comes with conditions.

Which quotation from the novel most effectively illustrates this claim?

- (A) "When Beatrix paid for my schooling, she also chose my courses, and each term she sent me the receipts, annotated in her careful hand with the subjects in which she expected me to excel."
- (B) "Beatrix gave freely and often, and she was rarely thanked for it, a fact she seemed not to notice."
- (C) "Beatrix had little patience for the neighbors, who she felt took advantage of the town's few charities."
- (D) "No one in the family could remember a holiday at which Beatrix had not arrived with gifts for everyone."

13

**Impervious Cover and Lag Time
in Eight Watersheds**



Hydrologist Laleh Moradi studied eight watersheds to examine how impervious surfaces, such as pavement and roofs, affect streams. For each watershed, she measured the percentage of land covered by impervious surfaces and the lag time: the number of hours between peak rainfall during a storm and peak streamflow. Moradi claims that the more of a watershed's area is covered by impervious surfaces, the more quickly its stream responds to heavy rainfall.

Which choice best describes data from the graph that support Moradi's claim?

- (A) Watersheds with a higher percentage of impervious cover tended to have longer lag times.
- (B) Lag time and the percentage of impervious cover were positively associated across the eight watersheds.
- (C) Two watersheds with nearly identical percentages of impervious cover had lag times that differed by more than 3 hours.
- (D) Watersheds with a higher percentage of impervious cover tended to have shorter lag times.

14

**Force Needed to Separate
Bonded Samples
(newtons)**

Adhesive	20°C	60°C
K	410	285
L	330	365
M	455	300

Materials scientist Óscar Ibarra tested three experimental adhesives, labeled K, L, and M, at two temperatures. The table shows the force needed to pull apart samples bonded with each adhesive. Ibarra notes that adhesive L was the only one whose bond strength increased at the higher temperature, _____

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

- (A) although adhesive M remained the strongest of the three adhesives at 60°C.
- (B) whereas adhesives K and M each lost more than half of their strength at 60°C.
- (C) making it the strongest of the three adhesives at 60°C even though it was the weakest at 20°C.
- (D) making it the strongest of the three adhesives at both temperatures.

15

In a study of reading comprehension, participants read passages either on paper or on screens and then answered questions about them. When participants could take as long as they wanted, the two groups performed equally well. When time was limited, however, participants who read on screens performed worse than those who read on paper. Researcher Ilse Brandvold notes that in a follow-up survey of the time-limited condition, screen readers reported having read faster than they normally would, while paper readers reported reading at their usual pace. Taken together, these findings suggest that _____

Which choice most logically completes the text?

- (A) reading on screens is inherently less effective for comprehension than reading on paper.
- (B) paper readers would have outperformed screen readers even without time limits if the passages had been longer.
- (C) participants who read on paper took longer to answer the questions than participants who read on screens.
- (D) the screen readers' poorer performance under time limits may stem from a tendency to speed up too much when reading on screens under pressure.

16 Bull kelp forests around the San Juan Islands in Washington State have declined sharply in recent decades, and many researchers attribute the losses to rising water temperatures. Ecologist Marisa Tolentino compared kelp sites across the islands and found that declines were indeed steepest where summer temperatures had risen most. At several of the warmest sites, however, kelp persisted wherever red sea urchins, which graze on kelp, were scarce, while nearby sites with similar temperatures but abundant urchins had lost nearly all their kelp. These findings suggest that _____

Which choice most logically completes the text?

- (A) rising water temperatures have had no effect on bull kelp in the San Juan Islands.
- (B) warming may harm kelp in part through its interaction with grazing pressure rather than only through direct effects on the kelp itself.
- (C) red sea urchins are more abundant at warm sites than at cool sites.
- (D) bull kelp would recover at most sites if water temperatures returned to earlier levels.

17 Some species of Antarctic fish produce antifreeze proteins that bind to tiny ice crystals in their blood, _____ the crystals from growing large enough to damage tissue.

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

- (A) preventing
- (B) prevent
- (C) prevents
- (D) they prevent

18 The decision by several regional orchestras, many of which had struggled for years to fill their concert halls, to perform in factories, gymnasiums, and public libraries _____ attendance among listeners who had never been to a symphony concert.

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

- (A) having increased
- (B) increased
- (C) to increase
- (D) increasing

19 Embedded in the clay walls of the ancient granary _____ thousands of carbonized seeds, which archaeologists have used to reconstruct the crops grown in the region.

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

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

20 The expedition's three research vessels each carried a specialized team: the *Aurora*, which mapped seafloor _____ the *Meridian*, which sampled the water column; and the *Kestrel*, which tracked marine mammals.

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

- (A) topography;
- (B) topography,
- (C) topography:
- (D) topography

- 21** Biochemist Thandiwe Mokoena's discovery that certain soil bacteria can break down polyfluorinated _____ a class of compounds once thought to persist in the environment indefinitely, has raised hopes for new cleanup methods.

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

- (A) chemicals
- (B) chemicals,
- (C) chemicals;
- (D) chemicals:

- 22** Although the Amazon River's floodplain forests are submerged for up to seven months each year, many of _____ tree species have evolved to thrive under these conditions, producing seeds that float and are eaten, and thereby dispersed, by fish.

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

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

- 23** Early accounts of the Silk Road emphasized the long-distance trade in luxury goods such as silk and spices. Historian Farida Nazarova argues that this emphasis obscures the routes' more ordinary character. _____ while caravans did occasionally carry goods across the entire span from China to the Mediterranean, most merchants traveled only short stretches, trading everyday items such as grain, salt, and pottery between neighboring towns.

Which choice completes the text with the most logical transition?

- (A) Nevertheless,
- (B) Specifically,
- (C) Consequently,
- (D) Still,

- 24** Most deep-sea anglerfish have a lure, a modified spine tipped with glowing bacteria, that attracts prey in the darkness. The bacteria are not inherited from the fish's parents. _____ each young anglerfish must acquire its own population of glowing bacteria from the surrounding seawater, a process researchers are still working to understand.

Which choice completes the text with the most logical transition?

- (A) Moreover,
- (B) Even so,
- (C) Rather,
- (D) Similarly,

25

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

- Spider silk and silkworm silk are both protein fibers.
- Both are produced as liquid proteins that solidify into fibers as they are drawn out of the animal's body.
- Silkworms spin a single type of silk, which they use to make cocoons.
- Many spiders can produce up to seven types of silk, each from a different gland and suited to a different task.
- Dragline silk, which a spider uses as a safety line, is roughly five times stronger than steel of the same weight.

The student wants to emphasize a difference between spider silk and silkworm silk. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- (A) Unlike many other natural materials, spider silk and silkworm silk are both protein fibers that solidify as they are drawn out.
- (B) In contrast to many manufactured materials, spider dragline silk is roughly five times stronger than steel of the same weight.
- (C) Whereas silkworms spin a single type of silk, many spiders can produce up to seven types, each suited to a different task.
- (D) In contrast to what many people assume, silkworm silk, like spider silk, begins as a liquid protein.

26

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

- Ice-age megafauna such as mammoths and giant ground sloths dispersed the seeds of plants with large fruits.
- When these animals went extinct about 10,000 years ago, many such plants lost their main seed dispersers.
- Some of these plants, such as the Osage orange, still produce large fruits that no living native animal regularly eats.
- Botanists call such plants “anachronistic” because their traits evolved for interactions that no longer exist.
- Other examples include the avocado and the honey locust.

The student wants to define the term “anachronistic” as botanists use it and provide an example. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- (A) Botanists use the term “anachronistic” for many plants whose seeds were once dispersed by animals.
- (B) Mammoths and giant ground sloths dispersed the seeds of plants such as the avocado until about 10,000 years ago.
- (C) The avocado, the honey locust, and the Osage orange are all considered “anachronistic” by botanists.
- (D) Botanists call a plant “anachronistic” when its traits evolved for interactions that no longer exist; the Osage orange, for example, still produces large fruits suited to extinct megafauna.

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

- The Antikythera mechanism is an ancient Greek device made of interlocking bronze gears.
- It was recovered from a shipwreck off the Greek island of Antikythera in 1901.
- Researchers have used X-ray imaging to study its internal structure.
- The device modeled the movements of the Sun and Moon and predicted eclipses.
- No device of comparable mechanical complexity is known from the following thousand years.

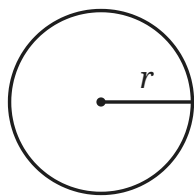
The student wants to emphasize the device's significance to an audience unfamiliar with it. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- (A) Recovered from a shipwreck in 1901, the Antikythera mechanism has been studied using X-ray imaging.
- (B) The Antikythera mechanism, an ancient Greek device of bronze gears that modeled the Sun and Moon and predicted eclipses, has no known equal in mechanical complexity from the following thousand years.
- (C) The Antikythera mechanism predicted eclipses, and nothing comparable is known from the following thousand years.
- (D) Researchers have used X-ray imaging to study the bronze gears inside an ancient Greek device recovered from a shipwreck off Antikythera.

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

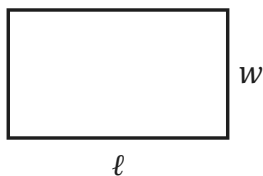
Math Reference Sheet

Use it during both Math modules

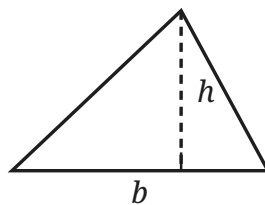


$$A = \pi r^2$$

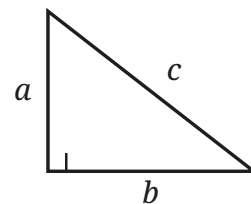
$$C = 2\pi r$$



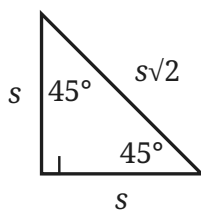
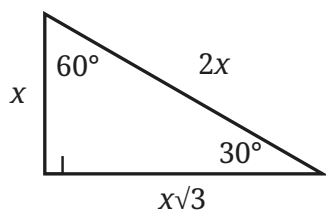
$$A = \ell w$$



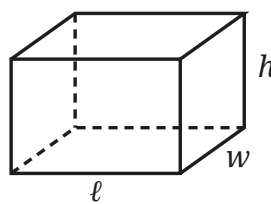
$$A = \frac{1}{2}bh$$



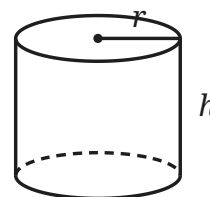
$$c^2 = a^2 + b^2$$



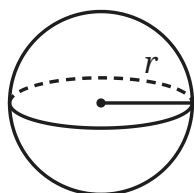
Special Right Triangles



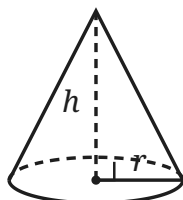
$$V = \ell wh$$



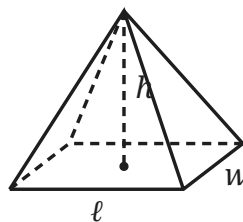
$$V = \pi r^2 h$$



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



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



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

- 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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- Figures provided are drawn to scale.
- All figures lie in a plane.
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- If a fraction doesn't fit, enter its decimal equivalent instead.
- If a decimal doesn't fit, truncate or round it at the fourth digit.
- 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 $3(2x - 5) = 4x + 9$, what is the value of $2x$?

- (A) 6
- (B) 12
- (C) 24
- (D) 48

2 A store increased the price of a jacket by 20%. Later, the store decreased the new price by 20%. The final price of the jacket was \$57.60. What was the jacket's original price?

- (A) \$46.08
- (B) \$55.30
- (C) \$57.60
- (D) \$60.00

- 3 The function $C(t) = 1,450 - 85t$ gives the number of liters of water remaining in a tank t minutes after a drain was opened. What is the best interpretation of 85 in this context?

- (A) Water drains from the tank at a rate of 85 liters per minute.
- (B) The tank initially held 85 liters of water.
- (C) The tank will be empty 85 minutes after the drain is opened.
- (D) 85 liters of water remain in the tank 1 minute after the drain is opened.

- 4 In triangle ABC , the measure of angle A is 38° , 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 The function $P(t) = 52,000(0.97)^t$ models the population of a town t years after 2020, where t is a whole number. According to the model, in what year will the town's population first be less than 40,000?

- (A) 2027
- (B) 2028
- (C) 2029
- (D) 2030

6

$$2x + 3y = 23$$

$$5x - y = 15$$

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

Your answer

- 7 The frequency table summarizes the number of books each of 15 students read over the summer. Which of the following statements about the data is true?

Books Read Over the Summer

Number of books	2	3	4	5	6
Frequency	3	5	4	2	1

- (A) The median is 4, and the mean is less than the median.
- (B) The median is 4, and the mean is greater than the median.
- (C) The median is 3, and the mean is less than the median.
- (D) The median is 3, and the mean is greater than the median.

- 8 The function f is defined by $f(x) = (x - 4)(2x + 7)$. The graph of $y = f(x)$ in the xy -plane crosses the x -axis at the points $(a, 0)$ and $(b, 0)$. What is the value of $a + b$?

Your answer

- 9 A caterer charges a \$120 setup fee plus \$18.50 per guest. A client's budget for catering is at most \$1,000. What is the maximum number of guests the client can invite?

- (A) 47
- (B) 48
- (C) 53
- (D) 54

- 10 In the xy -plane, the graph of $x^2 + y^2 - 6x + 10y = 15$ is a circle. What is the radius of the circle?

- (A) $\sqrt{15}$
- (B) 7
- (C) 15
- (D) 49

- 11 A printer uses 0.8 milliliter of ink per page and prints 25 pages per minute. A full ink cartridge holds 64 milliliters. If the printer starts with a full cartridge and prints continuously, after how many minutes will the cartridge be empty?

Your answer

- 12 The function g is defined by $g(x) = 2x^2 - kx + 5$, where k is a constant. If $g(3) = 2$, what is the value of $g(-1)$?

- (A) 0
(B) 7
(C) 14
(D) 16

- 13 Line ℓ passes through the points $(-2, 7)$ and $(4, -5)$. Line m is perpendicular to line ℓ and passes through the point $(6, 1)$. What is the y -intercept of line m ?

- (A) -2
(B) 1
(C) 3
(D) 4

- 14 Which of the following 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) $\frac{x - 9}{x - 6}$

- 15 The table shows the results of a survey of 200 students about whether they play a sport and whether they play a musical instrument. If one of the students who do **not** play a sport is selected at random, what is the probability that the student plays a musical instrument?

Survey Results

	Plays a sport	Does not play a sport	Total
Plays an instrument	38	27	65
Does not play an instrument	74	61	135
Total	112	88	200

- (A) $\frac{27}{200}$
(B) $\frac{27}{88}$
(C) $\frac{27}{65}$
(D) $\frac{61}{88}$

- 16 If $2^{3x} \cdot 4^{x+1} = 8^4$, what is the value of x ?

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

- 17 In right triangle PQR , angle R is a right angle and $\sin P = \frac{12}{13}$. What is the value of $\tan Q$?

- (A) $\frac{5}{13}$
(B) $\frac{5}{12}$
(C) $\frac{12}{13}$
(D) $\frac{12}{5}$

- 18** The height h , in feet, of a ball t seconds after it is thrown upward is modeled by $h(t) = -16t^2 + 64t + 5$. What is the maximum height, in feet, of the ball?

(A) 2
(B) 5
(C) 64
(D) 69

- 19** The cost of renting a kayak is a linear function of the number of hours it is rented. Renting a kayak for 3 hours costs \$57, and renting it for 7 hours costs \$101. For how many hours can a kayak be rented for a total cost of \$134?

(A) 7
(B) 9
(C) 10
(D) 12

- 20** Triangle ABC is similar to triangle DEF , where side AB corresponds to side DE . The length of AB is 6, the length of DE is 15, and the area of triangle DEF is 75. What is the area of triangle ABC ?

(A) 12
(B) 30
(C) 187.5
(D) 468.75

- 21** The equation $x^2 - (k + 5)x + 61 = 0$, where k is a constant, has no real solutions. What is the least possible integer value of k ?

Your answer

- 22** The function f is defined by $f(x) = ax^2 + bx + c$, where a , b , and c are constants. The graph of $y = f(x)$ in the xy -plane has its vertex at $(2, -14)$ and passes through the point $(0, -6)$. What is the value of $a + b + c$?

Your answer

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$-\frac{1}{3}$	-1/3 -.3333 -0.333	-.33 -0.33

- 1** If $5(x + 2y) = 3(2x + y) + 14$ and $x = 3y$, what is the value of y ?

Your answer

- 2** On a temperature scale called the D scale, water freezes at 40°D and boils at 290°D . The D scale is related linearly to the Celsius scale, on which water freezes at 0°C and boils at 100°C . What Celsius temperature corresponds to 115°D ?

- (A) 6°C
 (B) 30°C
 (C) 46°C
 (D) 327.5°C

- 3 The function f is defined by $f(x) = |2x - 7| - 3$. What is the sum of all values of x for which $f(x) = 5$?

(A) -0.5
(B) 3.5
(C) 7
(D) 7.5

- 4 A circle has center O and radius 9. Points A and B lie on the circle, and the length of minor arc AB is 4π . What is the area of the sector formed by minor arc AB and radii OA and OB ?

(A) 2π
(B) 4π
(C) 18π
(D) 36π

- 5 A bakery's mixer produces dough at a constant rate of 12 kilograms every 5 minutes. Each loaf of bread requires 0.75 kilogram of dough. At this rate, how many minutes does the mixer need to produce enough dough for 96 loaves?

(A) 30
(B) 40
(C) 72
(D) 172.8

6
$$p(x) = 2x^3 - 5x^2 + kx - 6$$

In the polynomial above, k is a constant. If $p(x)$ is divisible by $x - 3$, what is the remainder when $p(x)$ is divided by $x + 1$?

(A) -14
(B) -12
(C) -1
(D) 0

- 7 A theater sold 230 tickets for a performance. Adult tickets cost \$14 each, and student tickets cost \$9 each. Total ticket revenue was \$2,670. How many student tickets were sold?

(A) 90
(B) 100
(C) 110
(D) 120

8
$$kx + 4y = 9$$
$$6x + (k + 5)y = 18$$

In the system of equations above, k is a constant. For what value of k does the system have no solution?

(A) -8
(B) -3
(C) 3
(D) 8

- 9 The radius of a right circular cylinder is increased by 50%, and its height is decreased by 20%. By what percent does the volume of the cylinder increase?

(A) 10%
(B) 20%
(C) 30%
(D) 80%

- 10 The function $P(t) = 3,000(1.21)^t$ models the size of a population t years after the start of a study. Which of the following functions is equivalent to P and shows, as a constant or coefficient, the factor by which the population is multiplied every 6 months?

(A) $P(t) = 3,000(1.1)^{2t}$
(B) $P(t) = 3,000(1.1)^{t/2}$
(C) $P(t) = 3,000(1.105)^{2t}$
(D) $P(t) = 3,000(1.4641)^{2t}$

- 11 In the equation $a(3x - 4) + 2x = 17x - b$, a and b are constants. If the equation has infinitely many solutions, what is the value of b ?

Your answer

- 12 A researcher selected 250 households at random from County X and found that the mean number of streaming subscriptions per household in the sample was 2.6, with an associated margin of error of 0.3. Which of the following is the most appropriate conclusion?

- (A) The mean number of streaming subscriptions per household in County X is exactly 2.6.
- (B) Every household in County X has between 2.3 and 2.9 streaming subscriptions.
- (C) It is plausible that the mean number of streaming subscriptions per household in every county in the state is between 2.3 and 2.9.
- (D) It is plausible that the mean number of streaming subscriptions per household in County X is between 2.3 and 2.9.

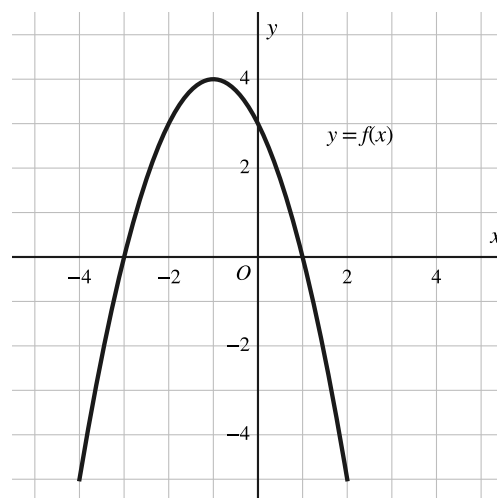
- 13 In the xy -plane, the line $y = mx$, where m is a positive constant, intersects the graph of $y = x^2 - 2x + 16$ at exactly one point. What is the value of m ?

Your answer

- 14 If $\sin((2k + 7)^\circ) = \cos((4k - 13)^\circ)$, where both angles are acute, what is the value of k ?

- (A) 10
- (B) 14
- (C) 15
- (D) 16

- 15 The graph of $y = f(x)$ is shown. If $g(x) = f(x - 3) + 2$, what is the y -intercept of the graph of $y = g(x)$?



- (A) $(0, -12)$
- (B) $(0, -10)$
- (C) $(0, 0)$
- (D) $(0, 2)$

16

$$y \geq x + 1$$

$$y \geq -2x + 10$$

The point (a, b) is a solution to the system of inequalities above. What is the minimum possible value of b ?

- (A) 3
- (B) 4
- (C) 7
- (D) 10

17

In 2024, 40% of a company's employees worked remotely. From 2024 to 2025, the total number of employees increased by 25%, and the number of employees who worked remotely increased by 50%. What percent of the company's employees worked remotely in 2025?

- (A) 45%
- (B) 48%
- (C) 50%
- (D) 60%

- 18 If $x > 0$ and $x^2 - 6x + 1 = 0$, what is the value of $x^2 + \frac{1}{x^2}$?

Your answer

- 19 In the xy -plane, two different circles each have their center in Quadrant I, are tangent to both the x -axis and the y -axis, and pass through the point $(2, 9)$. What is the radius of the smaller circle?

- (A) 5
(B) 9
(C) 11
(D) 17

20

$$y = x^2 - 4$$

$$y = |x| - 2$$

How many solutions does the system of equations above have?

- (A) 0
(B) 1
(C) 2
(D) 4

21

A car's fuel efficiency is 42 miles per gallon, and gasoline costs \$3.60 per gallon. If the car is driven at an average speed of 60 miles per hour, what is the cost of fuel, in dollars, per hour of driving?

Your answer

22

The function f is defined by $f(x) = a(x - 2)(x - 8)$, where a is a nonzero constant, and the graph of $y = f(x)$ in the xy -plane passes through the point $(6, 24)$. If $g(x) = f(x) + k$, where k is a constant, and the graph of $y = g(x)$ has exactly one x -intercept, what is the value of k ?

Your answer

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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| 13 (A) (B) (C) (D) | 14 (A) (B) (C) (D) |
| 15 (A) (B) (C) (D) | 16 (A) (B) (C) (D) |
| 17 (A) (B) (C) (D) | 18 (A) (B) (C) (D) |
| 19 (A) (B) (C) (D) | 20 (A) (B) (C) (D) |
| 21 (A) (B) (C) (D) | 22 (A) (B) (C) (D) |
| 23 (A) (B) (C) (D) | 24 (A) (B) (C) (D) |
| 25 (A) (B) (C) (D) | 26 (A) (B) (C) (D) |
| 27 (A) (B) (C) (D) | |

Math, Module 1

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| 1 (A) (B) (C) (D) | 2 (A) (B) (C) (D) |
| 3 (A) (B) (C) (D) | 4 <input type="text"/> |
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| 21 <input type="text"/> | 22 <input type="text"/> |

Reading and Writing, Module 2

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| 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) |
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Math, Module 2

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| 1 <input type="text"/> | 2 (A) (B) (C) (D) |
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| 21 <input type="text"/> | 22 <input type="text"/> |

Answer Key

Count your correct answers in each module

Reading and Writing, Module 1

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

Math, Module 1

1	C	Linear equations in one variable
2	D	Percentages
3	A	Linear functions
4	106.5 or 213/2	Lines, angles, and triangles
5	C	Nonlinear functions (exponential)
6	9	Systems of linear equations
7	D	One-variable data: center
8	1/2 or .5 or 0.5	Nonlinear functions (quadratic)

Reading and Writing, Module 2

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

Math, Module 2

1	7/2 or 3.5	Systems of linear equations
2	B	Linear functions
3	C	Nonlinear equations (absolute value)
4	C	Circles (arcs and sectors)
5	A	Rates and units
6	B	Polynomials (remainder theorem)
7	C	Systems of linear equations
8	A	Systems of linear equations
9	D	Volume

9	A	Linear inequalities
10	B	Circles
11	3.2 or 16/5	Rates and units
12	C	Function notation
13	A	Linear equations in two variables
14	B	Equivalent expressions
15	B	Probability and conditional probability
16	D	Exponents
17	B	Right triangle trigonometry
18	D	Nonlinear functions (quadratic)
19	C	Linear functions
20	A	Area and similarity
21	-20	Nonlinear equations: discriminant
22	-12	Nonlinear functions (quadratic)

10	A	Equivalent expressions (exponential)
11	20	Linear equations (infinitely many solutions)
12	D	Inference from sample statistics
13	6	Nonlinear systems: discriminant
14	D	Trigonometry (complementary angles)
15	D	Function transformations
16	B	Systems of linear inequalities
17	B	Percentages
18	34	Nonlinear equations
19	A	Circles
20	C	Nonlinear systems
21	36/7 or 5.142 or 5.143	Rates and units
22	-27	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. B. The colon introduces evidence for the blank: every one of 1,140 displays is recorded individually, with several details apiece. A record that complete is *exhaustive*. *Speculative* and *provisional* suggest guesswork or tentativeness, which the meticulous record contradicts, and nothing suggests the work copies others (*derivative*).

2. B. The second sentence shows the charge is false, because the model gives forty pages to informal lending. A charge contradicted by the evidence is hard to *sustain* (uphold).

Trap: *dismiss* flips the logic. A charge that is hard to dismiss would be one that seems true, the opposite of what the colon's evidence shows.

3. D. “Regard the place as a burden” means *consider* it a burden. **Trap:** *observe* matches the literal “look at” sense of *regard*, which doesn't work with the “as a burden” construction. *Admire* and *honor* would make the sentence say she couldn't admire it as a burden, which is nonsense.

4. C. The colon defines the blank: charming but too inconsistent for serious analysis. That is *anecdotal* evidence, based on personal accounts rather than systematic measurement. **Trap:** *contemporaneous* (from the same period) is true of the diaries but isn't what the colon describes. *Authoritative* and *indispensable* describe Okafor's view, not the climatologists'.

5. A. Before the underlined sentence, Tomas has a rehearsed plan. After it, “every sentence...slipped out of reach.” The underlined sentence is the unexpected turn between the two. **Trap:** D overreads “as though nothing at all were the matter”; that describes how Hale *appears*, not what he knows. B is never established.

6. B. Widely held view (scent evolves to attract pollinators) → challenging finding (attractive scents also draw petal-chewing beetles) → alternative interpretation (scent as a compromise). C fails because the results *complicate* the assumption rather than confirm it.

7. D. Say what the portion does: “The sentence before this said the relationship is *precarious*, and this part *shows how*.” A small shift in fog elevation can dry out a whole hillside, which is an illustration of precariousness. **Trap:** A describes the passage's *content* (plants and fog) rather than what the underlined portion *does*, and the portion never explains a mechanism of extraction.

8. D. The planners' contention is about cost: existing frames make conversion cheaper. Park found that in most cases the frame needed so much modification that savings were “negligible.” A has her *agreeing* on cost, the exact point she disputes. C invents a recommendation.

9. A. The unchanged street unsettles her and suggests that she had “never really been anywhere at all,” which is a reconsideration of her departures. B overreaches: no resolution to return is stated. D reverses the detail (the street is *unchanged*). Nothing suggests resentment (C).

10. A. The last sentence states Nwosu's suggestion directly: sunlight reacting with dissolved manganese in dew, “requiring no biological activity.” C contradicts the text (varnish is rich in manganese). B and D are never discussed.

11. C. The claim has two parts: change, and change happening *as she watches*. Footprints filling “slowly, from beneath” shows the shore altering in real time. A and D are static descriptions. B is about memory, not observed change.

12. C. The hypothesis has a claim (live beats recorded) and a mechanism (tutors *respond* to the young bird). C supports both: the advantage appears only when the tutor can see the young bird and therefore respond to it. B would *weaken* the mechanism. A and D don't address accuracy or responsiveness.

13. A. “Benefit increases over time” requires comparing the *gap* across years: -4 in year 1 (158 vs. 162), +15 in year 3 (174 vs. 159). B is false for year 1. C and D are accurate but describe one group or one year, so neither shows a change in benefit.

14. D. More pollinator species → smaller bars (62%, 41%, 23%, 9%). “More resilient” means a *smaller* decline, so the decline decreases as species increase. **Trap:** B flips the direction; A reverses the comparison. Say the direction word out loud before committing: *more species, less decline*. C is false (41% vs. 23%).

15. B. Three facts must all fit: (1) the glass is Mediterranean, (2) beads were made on site (crucibles, scraps, half-formed beads), (3) raw glass rarely traveled but finished objects did. Only recycling imported finished objects fits all three. A ignores the on-site production; C contradicts the chemical analysis; D is unsupported.

16. A. Raman's explanation is that physical condition, not the tag, drives early arrival. If so, holding condition constant should erase the difference between tagged and untagged birds. B contradicts Raman. C reverses cause and effect (early arrival leads to territory, not the other way). D is a recommendation the text doesn't support.

17. D. Two independent clauses, and the second explains what "vertical archive" means, so a colon works. A is a comma splice, B is a fused sentence, and C puts a semicolon before a coordinating conjunction, which the SAT treats as an error.

18. B. Find the main verb first. The subject is "The tardigrade"; everything between the commas is an appositive, and nothing after the blank is a finite verb ("hardens" and "protects" belong to relative clauses). So the blank must be the main verb: *shields*.

19. B. The subject is the singular "collection," not "letters" or "astronomers." Strip the prepositional phrase and the relative clause: "The collection...reveals."

20. C. The comma after "drives" closes a nonessential clause, so the clause must also open with a comma. Without it (A), a single comma would separate the subject from its verb "prompted." B and D use marks that can't introduce a relative clause.

21. C. The cooperative (singular, so *its*, not *it's* = it is) pools the catches belonging to its many members (plural possessive *members'*). A lacks the possessive; D uses a plural pronoun for a singular noun and a singular possessive for many members.

22. A. The opening modifier describes a person who was trained as an engineer, so the subject right after the comma must be Marchand herself. In B and C the subject is the works; in D it's "there."

23. D. The transition connects to the *previous sentence*: Brandt set out to refute the critics, and this sentence describes how she pursued that goal. The contrast ("despite...") is already handled inside the sentence. **Trap:** three choices are contrast words. Don't spend the transition on a contrast the sentence already contains.

24. C. The previous sentence says what the hermit does *not* do; this one gives the alternative behavior it uses in its place. *Instead* signals that replacement. *Consequently* wrongly implies that not defending territory causes traplining.

25. A. Write the goal in three words: *difference, carbon storage*. Only A states a difference in *how carbon is stored*. **Traps:** B and D contain contrast words ("unlike," "in contrast") but describe a *similarity* between the two ecosystems. C is a real difference, but in location, not carbon storage.

26. B. "How she conducted" = method. B gives the measurements and conditions. A gives results, C gives background, D gives motivation.

27. C. Two requirements: explain a *cause* of the shortages, and introduce Tambora to someone who has never heard of it. C does both. D never says what Tambora is or connects to food shortages; B omits Tambora entirely; A is a size statistic.

Reading and Writing, Module 2

1. A. The colon shows praise followed by complaints, so the admiration came with reservations: *qualified*. **Trap:** *feigned* (faked) goes too far, since nothing suggests the praise was insincere, only that it was limited. *Unanimous* and *belated* have no support.

2. C. The blank is the opposite of "rigorous," and the next sentence rebuts it by saying the estimates were "hardly the product of guesswork." So the historians portrayed the geologists as careless: *cavalier*. *Parochial* (narrow in outlook) and *obstinate* (stubborn) are criticisms, but not the one the rebuttal answers. *Dilatory* means slow.

3. D. The colon lists the furnishings: a table, four chairs, a shelf. The house is minimally furnished, or *austere*. *Surplus* (as in "spare tire"), *merciful* (as in "spare me"), and *slender* (as in "a spare frame") are real meanings of the word that don't fit this context.

4. B. For a feature to leave "almost no trace on the page" while surviving in speech, writers must avoid it: *eschew*. *Revive* and *proliferate* point the wrong direction; *misconstrue* (misinterpret) doesn't explain the absence.

5. A. "The sentence before said funding mattered little, and this part *supports* that with examples." **Traps:** B grabs "election," which sounds like leadership, but rotating leadership is introduced in the *next* sentence. C calls the examples exceptions, but they illustrate her main finding.

6. A. The mother answers every question, but her knowledge lives in her hands ("heft of her palm," "until it looks right"), so what the speaker most needs can't be handed over. B overreaches: she does share. D's "carelessness" contradicts the poem's respect for her skill. C has no support; the speaker says the crucial part is still missing.

7. C. Claim (no dark matter) → objection (distance misjudged) → response (second method matched) → limitation (a third method needed). D is wrong because nothing was retracted; B misreads the second measurement as competing rather than confirming.

8. C. Whitlock's manipulation changed participants' *interpretation*, and the gap shrank by more than half, not to zero. So she would say the gap *partly* reflects the setting. The precise word "partly" is what makes C right. A and D concede the bias explanation; B invents a claim about other goods.

9. D. Varga's objection depends on scribes switching *languages* or *levels of formality*. Text 2's last sentence removes both: every manuscript is formal Latin of one genre. So her usual objection has little to grip. **Trap:** A is what Varga would say about a typical study, and it's the answer you'd pick if you stopped before "Notably." Read every text to the last sentence.

10. D. Asante adds a factor ("not *merely* its loudness") rather than replacing noise outright. D captures that. A overstates ("no effect"); B states a mechanism the text never claims ("block"); C is unsupported.

11. C. Moon's own comparison says display feathers appear at maturity. If juveniles already had full-proportioned tail feathers, the feathers don't behave like display features. A and B *support* the hypothesis. D is irrelevant to this species' feathers.

12. A. The claim needs both halves: generosity *and* conditions. A shows her paying (generous) while choosing courses and setting expectations (conditions). B and D show generosity only; C shows impatience, not conditions on her own giving.

13. D. Translate the claim before looking at choices: responding "more quickly" means a *shorter* lag. So more cover should mean shorter lag, a negative association, which is what the graph shows. **Traps:** A and B both flip the direction (B hides the flip in the word "positively"). C is true (22% vs. 23% cover, 7.6 vs. 4.3 hours) but it cuts against a clean pattern rather than supporting the claim.

14. C. At 60°C: L = 365, M = 300, K = 285, so L is strongest. At 20°C: L = 330 is the lowest. A is false (M is 300 < 365). B is false (K kept about 70%, M about 66%). D is false at 20°C.

15. D. Screens only hurt under time pressure, and under pressure only screen readers sped up. D connects those two facts. A is contradicted by the untimed results ("equally well"). B and C go beyond the data.

16. B. At equally warm sites, kelp's fate depended on urchins, so heat alone doesn't decide the outcome. Yet declines were steepest where warming was greatest, so heat still matters. B holds both facts. A ignores the temperature pattern; C compares warm and cool sites, which the text never does; D predicts something untested.

17. A. The sentence already has its main verb ("produce"), and "bind" belongs to the relative clause. With no conjunction after the comma, the blank must begin a modifying phrase: *preventing*. B and C create a second finite verb with no subject or conjunction; D is a comma splice.

18. B. Find the subject and its verb: "The decision...[blank] attendance." Everything in between ("by several orchestras," the relative clause, "to perform in...") modifies "decision." No finite verb exists yet, so the blank needs one: *increased*. The infinitive "to perform" is a decoy that makes the sentence feel complete.

19. B. The sentence is inverted. Put it in normal order: "Thousands of carbonized seeds *were* embedded in the walls." The subject is the plural "thousands," not "granary" or "walls."

20. A. Each list item contains its own internal comma, so items must be separated by semicolons, and the text already uses one before "and the *Kestrel*." A comma here (B) would make the list impossible to parse.

21. B. "A class of compounds...indefinitely" is an appositive renaming the chemicals, and it closes with a comma before "has raised." It must open with a comma too. A leaves a lone comma between the subject ("discovery") and its verb.

22. A. The tree species belong to the *forests* (plural), so the pronoun is *their*. **Trap:** "Amazon River's" sits nearby and tempts *its*, but the river doesn't have tree species; its forests do.

23. B. This sentence spells out the "ordinary character" Nazarova mentions, so it gives specifics. The concession ("while caravans did occasionally...") is already built into the sentence. **Trap:** *Nevertheless* and *Still* react to that internal "while," not to the sentence before. Transitions link sentence to sentence.

24. C. The previous sentence denies one source (inheritance); this one supplies the correct source. *Rather* corrects a negative statement. *Even so* would mean "despite not being inherited," which is the wrong relationship.

25. C. Goal in three words: *difference, spider vs. silkworm*. C is the only choice that compares the two silks and finds a difference. **Traps:** A and D use contrast words but state *similarities* between the two silks. B contrasts spider silk with steel, not with silkworm silk.

26. D. Two jobs: a definition and an example. D does both. A gives a vague, inaccurate definition and no example; C gives examples with no definition; B gives neither.

Math, Module 1

1. C. $6x - 15 = 4x + 9 \Rightarrow 2x = 24$. Stop there: the question asks for $2x$, not x . **Trap:** 12 is x .

2. D. The two changes multiply: $1.2 \times 0.8 = 0.96$. So $0.96P = 57.60$, and $P = 57.60 \div 0.96 = 60$. **Traps:** \$55.30 multiplies by 0.96 when the final price is known and you need to *undo* the change (divide). \$57.60 assumes +20% and -20% cancel, and \$46.08 applies the 20% decrease a second time.

3. A. 85 is the coefficient of t , the change in liters per minute. The negative sign means the water is decreasing. D confuses the rate with the amount remaining ($C(1) = 1,365$).

4. 106.5 or 213/2. $38 + 3c + c = 180 \Rightarrow 4c = 142 \Rightarrow c = 35.5$. Then $B = 3(35.5) = 106.5$. **Trap:** 35.5 is angle C , which is what you solve for first. Before entering, reread the last clause: "angle B ."

5. C. $P(8) = 52,000(0.97)^8 \approx 40,755$ and $P(9) \approx 39,532$. The first whole t with $P(t) < 40,000$ is $t = 9$, the year 2029. **Trap:** solving $0.97^t = 40,000/52,000$ gives $t \approx 8.61$; rounding *down* to 8 gives a year when the population is still above 40,000.

6. 9. From the second equation, $y = 5x - 15$. Substituting: $2x + 15x - 45 = 23 \Rightarrow x = 4$, so $y = 5$ and $x + y = 9$.

7. D. With 15 values, the median is the 8th. The first 3 values are 2 and values 4–8 are 3, so the median is 3. Mean = $\frac{2(3)+3(5)+4(4)+5(2)+6(1)}{15} = \frac{53}{15} \approx 3.53 > 3$. **Trap:** 4 is the middle of the *listed values* 2–6, which ignores the frequencies.

8. 1/2 or .5 or 0.5. The zeros are $x = 4$ and $x = -\frac{7}{2}$. Their sum is $4 - 3.5 = 0.5$. Watch the sign on the second zero: $2x + 7 = 0$ gives $x = -3.5$, not $+3.5$ or -7 .

9. A. $120 + 18.5g \leq 1,000 \Rightarrow g \leq 47.56 \dots$ The maximum whole number is 47. **Traps:** 48 rounds up, which costs $120 + 18.5(48) = \$1,008$, over budget. 54 ignores the setup fee.

10. B. Complete the square: $(x - 3)^2 + (y + 5)^2 = 15 + 9 + 25 = 49$. The radius is $\sqrt{49} = 7$. **Traps:** $\sqrt{15}$ skips completing the square; 49 is r^2 .

11. 3.2 or 16/5. Track units. Pages: $64 \text{ mL} \div 0.8 \frac{\text{mL}}{\text{page}} = 80$ pages. Minutes: $80 \text{ pages} \div 25 \frac{\text{pages}}{\text{min}} = 3.2$ minutes. Each step divides because the unit you want (pages, then minutes) is in the *denominator* of the rate. Multiplying anywhere (e.g., $64 \times 0.8 \div 25 = 2.048$) leaves units that don't cancel.

27. B. Significance = what it did and how unmatched it was; unfamiliar audience = say what it is. B does both. **Trap:** C conveys significance but never tells the reader what the mechanism *is*. A and D describe its recovery and study, not its significance.

12. C. $g(3) = 18 - 3k + 5 = 2 \Rightarrow k = 7$. Then $g(-1) = 2(1) + 7 + 5 = 14$. **Trap:** 7 is k , the intermediate value.

13. A. Slope of $\ell = \frac{-5-7}{4-(-2)} = -2$, so line m has slope $\frac{1}{2}$: $y - 1 = \frac{1}{2}(x - 6) \Rightarrow y = \frac{1}{2}x - 2$. The y -intercept is -2 . **Traps:** 4 is line m 's x -intercept, 3 is line ℓ 's y -intercept, and 1 is just the y -coordinate of the given point.

14. B. $\frac{(x-3)(x+3)}{(x+3)(x-2)} = \frac{x-3}{x-2}$. D cancels terms instead of factors.

15. B. "Selected from students who do not play a sport" fixes the denominator at 88. Of those, 27 play an instrument: $\frac{27}{88}$. **Traps:** $\frac{27}{200}$ uses everyone; $\frac{27}{65}$ conditions on the wrong group; $\frac{61}{88}$ answers "does *not* play an instrument."

16. D. Rewrite in base 2: $2^{3x} \cdot 2^{2x+2} = 2^{12} \Rightarrow 5x + 2 = 12 \Rightarrow x = 2$.

17. B. $\sin P = \frac{QR}{PQ} = \frac{12}{13}$, so $QR = 12$, $PQ = 13$, and $PR = 5$. From angle Q , the opposite side is PR and the adjacent leg is QR : $\tan Q = \frac{5}{12}$. **Trap:** $\frac{12}{5}$ is $\tan P$. Label the triangle from the angle the question names.

18. D. The vertex is at $t = \frac{-64}{2(-16)} = 2$, and $h(2) = -64 + 128 + 5 = 69$. **Trap:** 2 is *when* the maximum occurs, not the maximum.

19. C. Slope = $\frac{101-57}{7-3} = 11$ dollars per hour, so the fixed fee is $57 - 3(11) = 24$. Then $24 + 11h = 134 \Rightarrow h = 10$.

Traps: $134 \div 11 \approx 12$ ignores the fee; 7 and 9 divide 134 by an average cost per hour (\$19 or about \$14.43), which treats the fixed fee as if it grew with time.

20. A. Areas scale by the *square* of the length ratio: $75 \left(\frac{6}{15}\right)^2 = 75(0.16) = 12$. **Traps:** 30 uses the ratio unsquared; the larger values scale in the wrong direction (ABC is the smaller triangle).

21. -20. No real solutions means discriminant < 0 : $(k + 5)^2 - 244 < 0 \Rightarrow |k + 5| < \sqrt{244} \approx 15.62 \Rightarrow -20.62 < k < 10.62$. Write both endpoints, then circle the one asked for: the **least** integer is -20 . **Traps:** 10 is the greatest; -21 is outside the interval ($(-16)^2 = 256 > 244$).

22. -12. Vertex form: $f(x) = a(x - 2)^2 - 14$. Using $(0, -6)$: $4a - 14 = -6 \Rightarrow a = 2$. The shortcut: $a + b + c = f(1) = 2(1 - 2)^2 - 14 = -12$. (Expanded: $f(x) = 2x^2 - 8x - 6$, and $2 - 8 - 6 = -12$.)

Math, Module 2

1. 7/2 or 3.5. Expand: $5x + 10y = 6x + 3y + 14 \Rightarrow -x + 7y = 14$. Substituting $x = 3y$: $4y = 14 \Rightarrow y = 3.5$.

2. B. 250 D-degrees span 100 C-degrees, so $D = 2.5C + 40$. Undo in reverse order: subtract 40 *first*, then divide: $C = \frac{115-40}{2.5} = 30$. **Traps:** 6 divides first and then subtracts ($115/2.5 - 40$). 46 forgets the offset; 327.5 converts the wrong direction.

3. C. $|2x - 7| = 8 \Rightarrow 2x - 7 = 8$ or $2x - 7 = -8 \Rightarrow x = 7.5$ or $x = -0.5$. The sum is 7. **Traps:** -0.5 and 7.5 are single roots; 3.5 is their *average* (where the V bottoms out), not their sum.

4. C. The arc is $\frac{4\pi}{18\pi} = \frac{2}{9}$ of the circumference, so the sector is $\frac{2}{9}$ of the area: $\frac{2}{9}(81\pi) = 18\pi$. (Equivalently, $\theta = \frac{4\pi}{9}$ and $A = \frac{1}{2}r^2\theta = 18\pi$.) **Traps:** 4π is the arc length, the wrong quantity; 36π drops the $\frac{1}{2}$; 2π uses r where r^2 belongs.

5. A. Dough needed: $96 \times 0.75 = 72$ kg (multiply: loaves $\times$ kg/loaf = kg). Rate: $12 \div 5 = 2.4$ kg/min. Time: $72 \text{ kg} \div 2.4 \frac{\text{kg}}{\text{min}} = 30$ min. **Traps:** 172.8 multiplies by the rate (units become kg^2/min); 40 forgets the 0.75 kg per loaf; 72 is the kilograms of dough, an intermediate value rather than the minutes asked for.

6. B. Divisible by $x - 3$ means $p(3) = 0$: $54 - 45 + 3k - 6 = 0 \Rightarrow k = -1$. The remainder on division by $x + 1$ is $p(-1) = -2 - 5 + 1 - 6 = -12$. **Traps:** -1 is k ; -14 uses $k = +1$.

7. C. $a + s = 230$ and $14a + 9s = 2,670$. Substituting $a = 230 - s$: $3,220 - 5s = 2,670 \Rightarrow s = 110$. **Trap:** 120 is the number of adult tickets.

8. A. No solution requires equal slopes: $\frac{k}{6} = \frac{4}{k+5} \Rightarrow k^2 + 5k - 24 = 0 \Rightarrow k = 3$ or $k = -8$. Now check the constants. If $k = 3$, the equations are $3x + 4y = 9$ and $6x + 8y = 18$, the *same line* (infinitely many solutions). If $k = -8$, the lines are parallel and distinct. **Trap:** 3 survives the slope test but fails the constant test.

9. D. $V = \pi r^2 h$, so the new volume is $(1.5)^2(0.8) = 1.8$ times the original: an 80% increase. **Traps:** 20% forgets to square the radius factor; 30% adds percents.

10. A. $(1.1)^2 = 1.21$, so $(1.1)^{2t} = (1.21)^t$, and $2t$ counts half-years. **Trap:** C halves the percent ($21\% \rightarrow 10.5\%$), which ignores compounding: $1.105^2 \approx 1.221 \neq 1.21$. B and D aren't equivalent.

11. 20. Infinitely many solutions means both sides are identical: $(3a + 2)x - 4a = 17x - b$. Match x -coefficients: $3a + 2 = 17 \Rightarrow a = 5$. Match constants: $-4a = -b \Rightarrow b = 20$. **Trap:** 5 is a .

12. D. A margin of error gives a plausible range for the *population mean* of the population sampled. A claims certainty; B applies the interval to individual households; C generalizes beyond County X.

13. 6. Set equal: $x^2 - (2 + m)x + 16 = 0$. Exactly one intersection means discriminant = 0: $(2 + m)^2 = 64 \Rightarrow 2 + m = \pm 8 \Rightarrow m = 6$ or $m = -10$. The stem says m is **positive**, so $m = 6$. Write both, then circle the one that matches the condition.

14. D. $\sin \theta = \cos(90^\circ - \theta)$, so the angles are complementary: $(2k + 7) + (4k - 13) = 90 \Rightarrow 6k = 96 \Rightarrow k = 16$. Check: 39° and 51° , both acute. **Traps:** 10 sets the angles *equal*; 14 flips the sign of the constants ($6k + 6 = 90$); 15 drops them ($6k = 90$).

15. D. $g(0) = f(0 - 3) + 2 = f(-3) + 2$. From the graph, $f(-3) = 0$, so $g(0) = 2$. **Traps:** $(0, 0)$ is $f(-3)$ without the $+2$. $(0, -10)$ is $f(3) + 2$, the horizontal shift in the wrong direction, and $(0, -12)$ is $f(3)$ alone.

16. B. The solution region lies above both lines, so its lowest point is where they meet: $x + 1 = -2x + 10 \Rightarrow x = 3$, $y = 4$. The minimum b is the y -coordinate, 4. **Trap:** 3 is the x -coordinate.

17. B. Use 100 employees in 2024: 40 remote. In 2025: 125 employees, 60 remote. $\frac{60}{125} = 48\%$. **Trap:** 60% is $40\% \times 1.5$, which forgets the total also grew.

18. 34. Divide by x : $x - 6 + \frac{1}{x} = 0 \Rightarrow x + \frac{1}{x} = 6$. Square: $x^2 + 2 + \frac{1}{x^2} = 36 \Rightarrow x^2 + \frac{1}{x^2} = 34$. (Solving for $x = 3 + 2\sqrt{2}$ works too, just slower.)

19. A. Tangent to both axes in Quadrant I means center (r, r) . So $(2 - r)^2 + (9 - r)^2 = r^2 \Rightarrow r^2 - 22r + 85 = 0 \Rightarrow (r - 5)(r - 17) = 0$. The **smaller** radius is 5. **Trap:** 17 is the larger circle.

20. C. $x^2 - 4 = |x| - 2 \Rightarrow |x|^2 - |x| - 2 = 0 \Rightarrow (|x| - 2)(|x| + 1) = 0$. Only $|x| = 2$ works, so $x = \pm 2$: two solutions, $(2, 0)$ and $(-2, 0)$. **Trap:** 4 comes from solving $x^2 - x - 2 = 0$ and $x^2 + x - 2 = 0$ and keeping $x = -1$ and $x = 1$, which violate the sign condition on each piece.

21. 36/7 or 5.142 or 5.143. Chain the units so they cancel: $60 \frac{\text{mi}}{\text{hr}} \div 42 \frac{\text{mi}}{\text{gal}} \times 3.60 \frac{\text{\$}}{\text{gal}} = \frac{216}{42} = \frac{36}{7} \approx 5.14$ dollars per hour. Dividing by 42 is the step people flip: miles per hour *divided* by miles per gallon gives gallons per hour. ($60 \times 42 \times 3.6$ has units of $\text{mi}^2 \cdot \text{\$/}(\text{hr} \cdot \text{gal}^2)$.)

22. -27. $f(6) = a(4)(-2) = -8a = 24 \Rightarrow a = -3$, so the parabola opens down with vertex at $x = 5$ (midway between the zeros) and maximum $f(5) = -3(3)(-3) = 27$. For $g = f + k$ to touch the x -axis exactly once, the vertex must be lowered to height 0: $27 + k = 0 \Rightarrow k = -27$. **Trap:** 27 is the vertex height; the shift that cancels it is negative.