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SAT 2-Hr Diagnostic

Edition 2.3

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SAT

This exam is a short diagnostic to help you assess your general strengths and weaknesses for the new SAT.

Directions

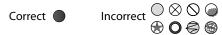
- Work on just one section at a time.
- If you complete a section before the end of your allotted time, use the extra minutes to check your work on that section only. Do NOT use the time to work on another section.

Using Your Test Booklet

- No credit will be given for anything written in the test booklet. You may use the test booklet for scratch paper.
- You are not allowed to continue answering questions in a section after the allotted time has run
 out. This includes marking answers on your answer sheet that you previously noted in your test
 booklet.
- You are not allowed to fold pages, take pages out of the test booklet, or take any pages home.

Answering Questions

- Each answer must be marked in the corresponding row on the answer sheet.
- Each bubble must be filled in completely and darkly within the lines.



- Be careful to bubble in the correct part of the answer sheet.
- Extra marks on your answer sheet may be marked as incorrect answers and lower your score.
- Make sure you use a No. 2 pencil.

Scoring

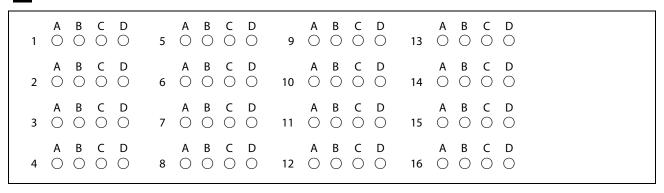
- You will receive one point for each correct answer.
- Incorrect answers will NOT result in points deducted. Even if you are unsure about an answer, you should make a guess.

DO NOT BEGIN THIS TEST UNTIL YOUR PROCTOR TELLS YOU TO DO SO

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Reading Test

35 MINUTES, 30 QUESTIONS

Turn to Section 1 of your answer sheet to answer the questions in this section.

DIRECTIONS

Every passage or paired set of passages is accompanied by a number of questions. Read the passage or paired set of passages, then use what is said or implied in what you read and in any given graphics to choose the best answer to each question.

Questions 1-10 are based on the following passage.

This passage is adapted from A. A. Milne, *The Red House Mystery*. Originally published in 1922.

The "Temple" was a brick summer-house, in the gardens at the back of The Red House, about three hundred yards away. Here Mark, the house's master, Lin meditated sometimes before retiring to the "office" to e put his thoughts upon paper. The thoughts were not of any great value; moreover, they were given off at the dinner-table more often than they got on to paper, and got on to paper more often than they got into print. But that did not prevent the master of The Red House from being a little pained when a visitor ¹⁰ treated the Temple carelessly, as if it had been erected for the ordinary purposes of flirtation and smoking. There had been an occasion when two of his guests had been found playing hand-tennis in it. Mark had said nothing at the time, save to ask with a ¹⁵ little less than his usual point—whether they couldn't find anywhere else for their game, but the offenders were never asked to The Red House again.

Audrey, the parlour-maid, walked slowly up to the Temple, looked in, and walked slowly back. The immediate business was to find the master, but all that walk was for nothing. Perhaps the master was upstairs in his room, and—listen! One of the men shooting rabbits. Mrs. Stevens, Audrey's aunt, was partial to a nice rabbit, and onion sauce. How hot it was, yet she wouldn't say no to a cup of tea.

She came into the house. As she passed the housekeeper's room on her way to the hall, the door opened suddenly, and a rather frightened face looked 30 out.

"Hallo, Aud," said Elsie. She was one of the housemaids. "It's Audrey," she said, turning into the room.

"Come in, Audrey," called Mrs. Stevens.

"What's up?" said Audrey, looking in at the door.
"Oh, my dear, you gave me such a turn. Where have you been?"

"Up to the Temple."

"Did you hear anything?"

"Hear what?"

"Bangs and explosions and terrible things."

"Oh!" said Audrey, rather relieved. "One of the men shooting rabbits. Why, I said to myself as I came along, 'Auntie's partial to a nice rabbit,' I said, and I shouldn't be surprised if—"

"Rabbits!" said her aunt scornfully. "It was inside the house, my girl."

"Straight it was," said Elsie. "I said to Mrs. Stevens—didn't I, Mrs. Stevens? —'That was in the 50 house,' I said."

Audrey looked at her aunt and then at Elsie.

"Do you think he had a revolver with him?" she said in a hushed voice.

"Who?" said Elsie excitedly.

"That brother of Mark's. From Australia. I said as soon as I set eyes on him, 'You're a bad lot, my man!'

That's what I said, Elsie. Even before he spoke to me. Rude!" She turned to her aunt. "Well, I give you my word."

"If you remember, Audrey, I always said there was no use speaking with anyone from Australia." Mrs. Stevens lay back in her chair, breathing rather rapidly. "I wouldn't go out of this room now, not if you paid me a hundred thousand pounds."

"Oh, Mrs. Stevens!" said Elsie, who badly wanted five shillings for a new pair of shoes, "I wouldn't go as far as that, not myself, but-"

"There!" cried Mrs. Stevens, sitting up with a start. They listened anxiously, the two girls

70 instinctively coming closer to the older woman's chair.

> A door was being shaken, kicked, rattled. "Listen!"

Audrey and Elsie looked at each other with 75 frightened eyes.

Which choice best summarizes the passage?

- A) The master of a house is sought, and his maids hear a startling sound.
- B) Housemaids discuss their employer, and witness an exciting rabbit hunt.
- C) A temple is described, and its master harshly criticizes his housemaids.
- D) A gunshot is heard, and housemaids hide in a bedroom from their employer.

10

The passage is narrated by

- A) a frightened bystander.
- B) a meticulous analyst.
- C) an omniscient observer.
- D) a bored houseguest.

As used in line 4, "retiring" most nearly means

- A) deteriorating.
- B) retreating.
- C) discharging.
- D) surrendering.

As used in line 12, "ordinary" most nearly means

- A) natural.
- B) boring.
- C) distasteful.
- D) unremarkable.

What can be reasonably inferred when Mark does not ask certain guests back to The Red House in lines 15-18 is that the "Temple" is

- A) off-limits to guests and visitors.
- B) embarrassingly run-down and outdated.
- C) home to Mark's wayward older brother.
- D) viewed by Mark as a place for quiet.

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 1-3 ("The Temple ... away")
- B) Lines 9-13 ("But that ... smoking")
- C) Lines 13-14 ("There had ... it")
- D) Lines 20-22 ("The immediate ... nothing")

7

The rhetorical effect of Mrs. Stevens's description of the gunshots in line 41 is to

- A) allude to Mrs. Stevens's extensive knowledge of guns.
- B) elicit feelings of disgust toward the sport of hunting.
- C) foreshadow Mrs. Stevens's participation in a crime.
- D) signal a potential and previously unrecognized danger.

8

The narrator indicates that Audrey and Mrs. Stevens believe Mark's brother to be

- A) impolite and noticeably suspicious.
- B) wealthy and slightly arrogant.
- C) charming and consistently hospitable.
- D) imposing and exhaustingly overbearing.

9

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 27-30 ("As she ... looked out")
- B) Lines 42-43 ("One of ... rabbits")
- C) Lines 55-56 ("I said ... man")
- D) Lines 63-64 ("I wouldn't ... pounds")

10

The author most likely includes Elsie's desire for a new pair of shoes in lines 65-66 to

- A) suggest that Elsie is not focused on the current situation.
- B) reveal that the housemaids do not have proper footwear.
- C) emphasize Elsie's initiative in dangerous environments.
- D) show that Elsie is only concerned about her physical appearance.

Questions 11-21 are based on the following passage and supplementary material.

This passage is adapted from Matthew Savoca, "The oceans are full of plastic, but why do seabirds eat it?" ©2016 by Matthew Savoca.

Plastic debris can be found in oceans around the world. Scientists have estimated that there are over five trillion pieces of plastic, weighing more than a quarter of a million tons, floating at sea globally. Plastic does not biodegrade, but at sea large pieces of plastic break down into increasingly smaller fragments that are easy for animals to consume. Animals that mistake plastic for a meal may suffer from malnutrition, intestinal blockage, or slow poisoning from chemicals in or attached to the plastic.

Despite the pervasiveness and severity of this problem, scientists still do not fully understand why so many marine animals make this mistake. It has been commonly assumed, but rarely tested, that seabirds eat plastic debris because it looks like their natural prey. However, we propose a new explanation: for many imperiled species, marine plastic debris also produces an odor that the birds associate with food.

Perhaps the most severely impacted animals are tube-nosed seabirds, a group that includes albatrosses, shearwaters, and petrels. Many are at risk of extinction; according to the International 25 Union for the Conservation of Nature, nearly half of the approximately 120 species of tube-nosed seabirds are either threatened, endangered, or critically endangered. As well, these birds are pelagic: they often remain at sea for years at a time, 30 searching for food over hundreds or thousands of square kilometers of open ocean. Although there are many fish in the sea, areas that reliably contain food are very patchy—tube-nosed seabirds are searching for a needle in a haystack when they forage. They 35 may be searching for fish, squid, krill, or other items, and it is possible that plastic debris visually resembles these prey. But we believe that tells only part of a more complex story.

12

In the early 1970s, Dr. Grubb Jr. showed that 40 tube-nosed seabirds use their powerful sense of smell to find food effectively. Later, Dr. Nevitt and colleagues found that certain species of tube-nosed seabirds are attracted to dimethyl sulfide (DMS), a naturally scented sulfur compound. DMS comes

45 from marine algae, which produce a related chemical called DMSP inside their cells. When those cells are damaged—for example, when algae die, or when marine grazers like krill eat it—DMSP breaks down, producing DMS. The smell of DMS alerts seabirds
 50 that food is nearby—not the algae, but the krill that are consuming the algae.

Dr. Nevitt and I wondered whether these seabirds were being tricked into consuming marine plastic debris because of the way it smelled. To test this idea, my co-authors and I created a database collecting every study we could find that recorded plastic ingestion by tube-nosed seabirds over the past 50 years. This research showed that species of birds that use DMS as a foraging cue eat plastic nearly six times as frequently as species that are not attracted to the smell of DMS while foraging.

To further test our theory, we needed to analyze how marine plastic debris smells. To do so, I took beads of the three most common types of floating

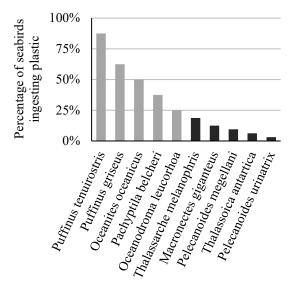
65 plastic—polypropylene and low- and high-density polyethylene—and sewed them inside custom mesh bags, which we attached to two buoys off of California's central coast. We hypothesized that algae would coat the plastic at sea, a process known of as biofouling, and produce DMS.

After the plastic had been immersed for about a month at sea, we retrieved it and brought it to a lab. There we used a gas chromatograph, specifically built to detect sulfur odors, to measure the chemical signature of our experimental marine debris. Sulfur compounds have a very distinct odor; to humans they smell like rotten eggs or decaying seaweed on the beach, but to some species of seabirds DMS smells delicious!

As proposed, every sample of plastic we collected was coated with algae and had substantial amounts of

DMS associated with it. We found levels of DMS that were higher than normal background concentrations in the environment, and well above levels that tube-nosed seabirds can detect and use to find food. Our results provide the first evidence that, in addition to looking like food, plastic debris may also confuse seabirds that hunt by smell.

Plastic ingestion and DMS responsiveness in seabirds



Seabird species

- Non-DMS-responsive species
- DMS-responsive species

11

The central claim of the passage is that

- A) DMS is a harmful chemical that should be removed from our oceans.
- B) Species that ingest plastic are in danger of becoming extinct.
- C) The smell of plastic leads some seabird species to mistake it for food.
- D) The production of DMS is crucial to the study of marine life.

12

Which of the following situations is most analogous to the problem presented in the passage?

- A) A young boy ingests harmful pills that resemble candy.
- B) A man makes changes to his diet to improve his health.
- C) A woman eats strawberries despite knowing she is allergic to them.
- D) A tourist is afraid to try a traditionally spicy local cuisine.

13

The passage most clearly implies that

- A) plastic smells like DMS because of its artificial nature.
- B) seabird prey ingest plastic in order to produce DMS.
- C) the biofouling process leads to production of DMS.
- D) all plastic smells like DMS until it is properly cleaned.

14

Which choice best supports the answer to the previous question?

- A) Lines 5-8 ("Plastic does ... consume")
- B) Lines 34-37 ("They may ... prey")
- C) Lines 49-51 ("The smell ... algae")
- D) Lines 80-82 ("As proposed ... it")

The author mentions that tube-nosed seabirds are at risk of extinction primarily to

- A) share his strong concern for all endangered species.
- B) imply that animals usually go extinct because of a lack of food.
- C) show that seabirds are uniquely vulnerable to ingesting plastic waste.
- D) emphasize the seriousness of seabirds ingesting plastic.

16

The author makes use of which of the following to support his argument?

- A) Results from research he conducted
- B) Interviews with marine biologists
- C) Reports on where seabirds usually find their food
- D) Studies on the chemical composition of DMS

17

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 14-17 ("It has ... prey")
- B) Lines 39-41 ("In the ... effectively")
- C) Lines 71-72 ("After the plastic ... lab")
- D) Lines 86-88 ("Our results ... smell")

18

14

As used in line 34, "forage" most nearly means

- A) chase.
- B) hunt.
- C) explore.
- D) ransack.

19

As used in line 59, "cue" most nearly means

- A) nod.
- B) signal.
- C) warning.
- D) suggestion.

20

Which choice is best supported by the graph?

- A) Seabird species all ingest roughly the same amount of plastic.
- B) Seabirds eventually learn to differentiate plastic from food.
- C) Seabirds become more responsive to DMS the more they encounter it.
- D) Seabird species that do not detect DMS consume less plastic.

21

Based on the passage and graph, which of the following is true of DMS?

- A) DMS is the only reason some seabird species mistakenly ingest plastic.
- B) Certain DMS-responsive seabird species are better at detecting DMS than others.
- C) Attraction to DMS makes seabirds significantly more likely to ingest plastic.
- D) DMS is only detectable by seabirds within a certain range of its source.

Questions 22-30 are based on the following passage.

This passage is adapted from Shirley Chisolm, "For the Equal Rights Amendment," delivered before the United States Congress in 1970. Chisolm, the first African American woman elected to Congress, was arguing in favor of a Constitutional amendment securing legal equality between men and women.

The resolution before us today, which provides for equality under the law for both men and women, represents one of the most clear-cut opportunities we are likely to have to declare our faith in the principles that shaped our Constitution. It provides a legal basis for attack on the most subtle, most pervasive, and most institutionalized form of prejudice that exists. Discrimination against women, solely on the basis of their sex, is so widespread that is seems to many persons normal, natural, and right.

Legal expression of prejudice on the grounds of religious or political belief has become a minor problem in our society. Prejudice on the basis of race is, at least, under systematic attack. It is time we act to assure full equality of opportunity to those citizens who, although in a majority, suffer the restrictions that are commonly imposed on minorities—women.

The argument that this amendment will not solve the problem of sex discrimination is not relevant. If the argument were used against a civil rights bill, as it has been used in the past, the prejudice that lies behind it would be embarrassing. Of course laws will not eliminate prejudice from the hearts of human beings. But that is no reason to allow prejudice to continue to be enshrined in our laws—to perpetuate injustice through inaction.

What would the legal effects of the equal rights amendment really be? The equal rights amendment would govern only the relationship between the State and its citizens—not relationships between private citizens. The amendment would be largely self-executing, that is, any Federal or State laws in conflict would be ineffective one year after the date of ratification without further action by the Congress or State legislatures.

Jury service laws not making women equally liable for jury service would have been revised. The

selective service law would have to include women, but women would not be required to serve in the 40 Armed Forces where they are not fitted any more than men are required to serve.

Survivorship benefits would be available to husbands of female workers on the same basis as to wives of male workers. Public schools and universities could not be limited to one sex and could not apply different admission standards to men and women. Laws requiring longer prison sentences for women than men would be invalid, and equal opportunities for rehabilitation and vocational training would have to be provided in public correctional institutions.

What would be the economic effects of the equal rights amendment? Direct economic effects would be minor. If any labor laws applying only to women still remained, their amendment or repeal would provide opportunity for women in better-paying jobs in manufacturing. More opportunities in public vocational and graduate schools for women would also tend to open up opportunities in better jobs for women.

Indirect effects could be much greater. The focusing of public attention on the gross legal, economic, and social discrimination against women by hearings and debates in the Federal and State

65 legislatures would result in changes in attitude of parents, educators, and employers that would bring about substantial economic changes in the long run.

This is what it comes down to: artificial distinctions between persons must be wiped out of the law. Legal discrimination between the sexes is, in almost every instance, founded on outmoded views of society and the pre-scientific beliefs about psychology and physiology. It is time to sweep away these relics of the past and set further generations free of them.

The Constitution was designed to protect the rights of white, male citizens. As there were no black Founding Fathers, there were no founding mothers—a great pity, on both counts. It is not too late to complete the work they left undone. Today, here, we should start to do so.

The stance Chisolm takes in the passage is best described as that of

- A) a weary radical.
- B) a passionate advocate.
- C) an excited politician.
- D) an optimistic scholar.

23

According to Chisolm, legal distinctions between the sexes

- A) protect important differences.
- B) are usually valid, but occasionally harmful.
- C) reflect outdated thinking.
- D) have only minimal effects.

24

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 8-10 ("Discrimination against ... right")
- B) Lines 14-17 ("It is ... women")
- C) Lines 27-28 ("What would ... be")
- D) Lines 70-73 ("Legal ... and physiology")

25

16

Chisolm characterizes discrimination against women as

- A) unfortunate but unavoidable.
- B) accepted but unjust.
- C) embarrassing but necessary.
- D) illegal but common.

26

As used in line 11, "expression" most nearly means

- A) assertion.
- B) intensity.
- C) announcement.
- D) emotion.

27

Chisolm recognizes and dismisses which of the following counterarguments?

- A) Legal remedies are insufficient for eradicating
- B) The Constitutional amendment would change the demographics of the Armed Forces.
- C) America is already more equitable than other countries.
- D) The Constitutional amendment would rob women of certain benefits.

28

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 5-7 ("It provides ... exists")
- B) Lines 22-24 ("Of course ... beings")
- C) Lines 28-30 ("The equal ... its citizens")
- D) Lines 53-54 ("Direct economic ... minor")

29

As used in line 40, "fitted" most nearly means

- A) contoured.
- B) shaped.
- C) fixed.
- D) suited.

30

The contrast between direct and indirect effects in lines 52-67 serves primarily to

- A) argue that although no one knows what the immediate ramifications of the amendment will be, the ultimate effect will be small.
- B) imply that while some of the things people fear may come to pass, there will also be unpredictable benefits.
- suggest that the impact of the amendment will be considerably larger in the future than in the present day.
- D) state that certain aspects of people's lives will be changed severely, while other aspects will remain much the same.

STOP

If you complete this section before the end of your allotted time, check your work on this section only. Do NOT use the time to work on another section.

Writing and Language Test

35 MINUTES, 44 QUESTIONS

Turn to Section 2 of your answer sheet to answer the questions in this section.

DIRECTIONS

Every passage comes with a set of questions. Some questions will ask you to consider how the writer might revise the passage to improve the expression of ideas. Other questions will ask you to consider correcting potential errors in sentence structure, usage, or punctuation. There may be one or more graphics that you will need to consult as you revise and edit the passage.

Some questions will refer to a portion of the passage that has been underlined. Other questions will refer to a particular location in a passage or ask that you consider the passage in full.

After you read the passage, select the answers to questions that most effectively improve the passage's writing quality or that adjust the passage to follow the conventions of standard written English. Many questions give you the option to select "NO CHANGE." Select that option in cases where you think the relevant part of the passage should remain as it currently is.

Questions 1-11 are based on the following passage.

Disputes in Ancient Greek Philosophy

People often speak of "the philosophy of the ancient Greeks" or "what the Greeks believed," as though they had a single shared opinion. However, ancient Greek philosophers held a great diversity of opinions, founding many schools of thought that shaped the development of culture in the West and beyond.

1

- A) NO CHANGE
- B) Meanwhile, ancient
- C) Ancient
- D) Consequently, ancient

2 The thinker Epicurus developed Epicureanism in the 4th century BCE. Epicurus and his followers challenged 3 <u>humdrum</u> beliefs of the time by claiming that all events unfolded according to physical rules, without any intervention from the gods—but with occasional random swerves of atoms. This stance was highly controversial in Greece's polytheistic society. Epicurus also stated that people could achieve happiness by avoiding suffering and enjoying natural pleasures, which led many to perceive him as endorsing selfindulgence. As a result, the word "epicurean" is used to this day to describe someone who enjoys luxury and decadence, especially in the realm of fine dining.

The most famous rivals of the Epicureans were the Stoics. The Stoic school of thought was founded in the 4th century BCE by the 4 philosopher Zeno. However, its most well-known follower, the Roman emperor Marcus Aurelius, lived and wrote much later, in the 2nd century CE. The Stoics, unlike the Epicureans, believed that a 5 divine will they called "the Logos" influenced all events. Thus, the Stoics thought that people could not control their fates and so should cultivate self-control and composure, even in the face of hardship. Because of these teachings, the word "stoic" has now come to mean "calm," "steady," or even "emotionless."

Which choice most effectively conveys the main topic of this paragraph?

- A) One of the foremost of these philosophical movements was Epicureanism.
- B) Of course, thinkers in other parts of the world also developed many great philosophies.
- C) These schools often argued with one another, each claiming to have the best doctrine.
- D) Many of these philosophers held positions that Greek society considered unpopular and controversial.

- A) NO CHANGE
- B) routine
- C) mundane
- D) conventional

- A) NO CHANGE
- B) philosopher Zeno, however, its most
- C) philosopher Zeno but its most
- D) philosopher Zeno. Though its most

- A) NO CHANGE
- B) divine will, they called
- C) divine will: they called
- D) divine will—they called

[1] The Cynics, another group of philosophers with roots in 4th century BCE Greece, held views similar to

6 the Stoics. [2] For instance, the best-known Cynic,
Diogenes of Sinope, lived in a large jar in the marketplace of Athens, begged and scavenged for food, and mocked

7 well-respected public figures who were held in high esteem. [3] They emphasized independence, however, claiming that desires for wealth and social power clouded the mind. [4] Only if one gave up the pursuit of these desires, they said, could

8 you live a virtuous life. [5]
The Cynics thus chose to live without possessions or status and rejected social norms. [6] The Cynics' distrust of societal institutions and authority has led to the word "cynical" being used to describe people who doubt the motivations of others and criticize society.

6

- A) NO CHANGE
- B) those Stoics.
- C) Stoics.
- D) those of the Stoics.

7

- A) NO CHANGE
- B) well-respected public figures of high esteem
- C) esteemed public figures
- D) respected public figures of esteem

8

- A) NO CHANGE
- B) one live
- C) they live
- D) he or she live

9

For the sake of the cohesion of this paragraph, sentence 2 should be placed

- A) where it is now.
- B) after sentence 3.
- C) after sentence 4.
- D) after sentence 5.

Greek philosophy has had a profound influence on culture worldwide. Alexander the Great's conquest carried these ideas across the Middle East and Asia, bringing them into contact with many other 10 cultures in the Middle East, the frugal ideals from Cynicism influenced early Christians, leading some to give up their possessions to live in poverty in the desert. 11 Greek philosophy continues to influence academics, students, and citizens today.

10

- A) NO CHANGE
- B) cultures. In the Middle East. The
- C) cultures. In the Middle East, the
- D) cultures in the Middle East the

11

At this point, the writer wants to expand on the idea of Greek ideas spreading through the Middle East and Asia. Which choice best accomplishes this goal?

- A) In the Judeo-Christian tradition, the desert has long been associated with religious experience.
- B) In India and Central Asia, Stoicism and Buddhism may have exchanged ideas about the importance of self-control and tranquility.
- C) Indeed, Christianity quickly spread beyond the Middle East, expanding throughout the Roman empire and eventually becoming its official religion.
- D) Still, most people today would probably not say they are cynical.

24

Questions 12-22 are based on the following passage.

Genetically Modified Crops and the Future of Agriculture

For millennia, humans have altered the genes of the plants we eat. For as long as agriculture has existed, we have selectively cross-bred plants to raise crops with more desirable traits. Over the course of centuries, we have gradually improved our plant stocks and our breeding techniques. In recent decades, however, genetic engineering techniques that create genetically modified (GM) crops have 12 unconditionally accelerated the process of developing new and better crops. At the same time, these techniques have raised concerns and spurred controversy.

Since the 1980s, scientists have developed several new methods to create GM crops. Scientists can modify plants by creating a ring of DNA called a 13 "plasmid," then they insert the plasmid into plant cells. In some cases, scientists use bacteria that naturally "infect" plants with plasmids to deliver 14 there own lab-created plasmids. Other scientists use "gene guns" to shoot microscopic gold particles coated with genetic material directly into target cells. All these methods create plants that contain carefully selected genes, turning conventional crops into 15 a genetically modified organism.

12

- A) NO CHANGE
- B) radically
- C) gradually
- D) instantly

13

- A) NO CHANGE
- B) plasmid. Whereupon, they insert
- C) "plasmid," they insert
- D) "plasmid" and inserting

14

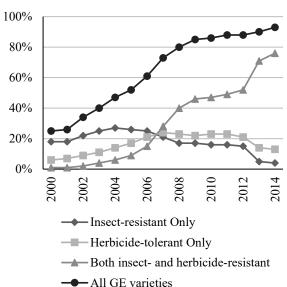
- A) NO CHANGE
- B) they're
- C) their
- D) they

15

- A) NO CHANGE
- B) genetic modifications
- C) genetically modified organisms
- D) a genetic organism

16 One of the main applications of this technology is the creation of plants that are resistant to 17 certain pests, diseases, and herbicides. These GM crops have become very popular in the United States because farmers don't need to spend as much money on pesticides. The U.S. Department of Agriculture estimates that 18 93% of the corn planted in 2014 was both insect- and herbicideresistant, up from 25% in 2000. Genetic modification can also enhance the nutritional value of some crops, which is

> Genetically Modified (GM) Corn Varieties as a Percentage of All Corn Planted in the United States



16

Which choice most effectively conveys the main topic of this paragraph?

- A) There are a number of advantages to creating and planting GM crops.
- B) Farmers all over the world have enthusiastically embraced the use of GM crops.
- C) Most governments around the world have imposed regulations and controls on the use of this technology within their borders.
- D) As a result, scientists have much more control over the traits of GM crops than they would over conventionally bred varieties.

17

- A) NO CHANGE
- B) certain pests, and diseases, and herbicides
- C) certain pests; diseases; and herbicides
- D) certain: pests, diseases, and herbicides

18

Which of the following choices completes the sentence with accurate information from the graphic?

- A) NO CHANGE
- B) 76% of corn planted in 2014 was both insectand herbicide-resistant, up from 1% in 2000.
- C) 13% of corn planted in 2014 was both insectand herbicide-resistant, up from 6% in 2000.
- D) 18% of corn planted in 2014 was both insectand herbicide-resistant, up from 4% in 2000.

especially beneficial for people in the developing world.

19 On the other hand, the GM crop "golden rice" was engineered so that it contains vitamin A, a necessary nutrient that many people in Africa and South Asia lack in their diets. To meet the needs of Earth's rapidly growing population, some scientists are also experimenting with producing GM crops with above-average yields.

[1] Despite these potential benefits, many people view GM crops with suspicion. [2] Even though most scientists agree that food from GM crops is safe for human consumption, much of the general public fears that

20 they might pose unknown health risks. [3] Some conservation groups are also concerned about the effects that GM crops could have on the environment. [4] For instance, GM crops could outcompete wild plants, spawn toxin-resistant pests, or 21 to disrupt the natural food chain. [5] Clearly, we must carefully study and regulate GM crops to ensure that these risks do not outweigh the benefits. 22

19

- A) NO CHANGE
- B) Meanwhile,
- C) For example,
- D) However,

20

- A) NO CHANGE
- B) this food
- C) human consumption
- D) those

21

- A) NO CHANGE
- B) natural food chain disruption.
- C) the natural food chain may be disrupted.
- D) disrupt the natural food chain.

22

To make this paragraph most logical, sentence 4 should be placed

- A) where it is now.
- B) after sentence 1.
- C) after sentence 2.
- D) after sentence 5.

Questions 23-33 are based on the following passage.

Science in the Medieval Islamic World

The history of science as it is taught to most Western students 23 are tragically incomplete. In many schools, teachers promote the myth that little scientific progress occurred between the fall of the Roman Empire and the beginning of the Renaissance in Europe. It is true that European scholars made little progress 24 in the natural sciences during the Middle Ages. Scholars in the Islamic world made numerous significant scientific discoveries. These discoveries laid the groundwork for future breakthroughs and made Europe's later Scientific Revolution possible.

Many important mathematical concepts were developed by Muslim thinkers. The Persian mathematician 25 <u>al-Khwarizmi—who worked in the</u> 9th century CE, developed new methods for solving linear and quadratic equations. In fact, his name gave rise to the word "algorithm," a term used in modern mathematics and computer science to refer to a step-by-step method of 26 calculation and the term "algebra," from the Arabic "al-jabr," also comes from his work. He also popularized the Hindu-Arabic numerals that have become the most common way of writing numbers around the world today.

23

- A) NO CHANGE
- B) being
- C) is
- D) am

24

Which choice best combines the underlined sentences?

- A) in the natural sciences during the Middle Ages, and scholars in the Islamic world
- B) in the natural sciences during the Middle Ages: thus, scholars in the Islamic world
- C) in the natural sciences during the Middle Ages, but scholars in the Islamic world
- D) in the natural sciences during the Middle Ages: scholars in the Islamic world

25

- A) NO CHANGE
- B) al-Khwarizmi, who worked in the 9th century CE developed
- C) al-Khwarizmi, who worked in the 9th century CE-developed
- D) al-Khwarizmi, who worked in the 9th century CE, developed

26

- A) NO CHANGE
- B) calculation. The term
- C) calculation, also the term
- D) calculation, the term

[1] Muslim scientists also made important advances in the theory and practice of medicine. [2] For instance, the Persian doctor al-Razi revolutionized how doctors diagnosed disease. [3] In addition to this work on diagnosis, he pioneered techniques to test the effectiveness of treatments. [4] In the 9th century CE, he wrote a comparison of smallpox and measles in an early form of the modern technique of differential diagnosis.

[5] Centuries before European doctors adopted the technique, al-Razi conducted a clinical trial to study
27 how effective the practice of bloodletting was as a treatment for meningitis.
28

29 Throughout the medieval era, the dominant view among astronomers was the geocentric Ptolemaic model. This view held that the Earth was the center of the solar system and that the planets, Sun, and stars orbited around it.

27

- A) NO CHANGE
- B) the effectiveness of using bloodletting
- C) the effectiveness of bloodletting
- D) the effectiveness

28

For the sake of the logic and coherence of this passage, Sentence 3 should be placed

- A) where it is now.
- B) after sentence 1.
- C) after sentence 4.
- D) after sentence 5.

29

Which choice most effectively conveys the main topic of the paragraph?

- A) On occasion, medieval Muslim scientists, like their later European counterparts, were opposed in their work by religious authorities.
- B) Muslim scientists were not afraid to challenge widely accepted scientific ideas in the areas of mathematics, medicine, or astronomy.
- C) The achievements of Muslim scientists were remarkable in light of their limited access to advanced equipment.
- D) Furthermore, Muslim astronomers made accurate observations and predictions which would fuel later discoveries.

Astronomers working at the Maragha observatory in Persia, noting inconsistencies between this 30 models predictions and actual observations, developed new equations in the 13th century CE to resolve the conflict. Though they only updated the Ptolemaic theory, several centuries later their mathematical innovations inspired Nicolaus Copernicus. 31 Copernicus ultimately proposed a heliocentric model of the solar system, with the Earth and other planets orbiting the Sun, which would revolutionize astronomy.

In all, thinkers in the Islamic world made enormous contributions to the development of science. Had they not preserved ancient knowledge and 32 elaborated on it with their own findings, scientific and technological development might be centuries behind where it is today. 33 Even so, the accomplishments of medieval Muslim scientists should be better known around the world. More effort should be made to inform students about these pioneers of science.

30

- A) NO CHANGE
- B) model's
- C) models'
- D) models's

31

Which of the following sentences, inserted here, most effectively supports the claim made in the previous sentence?

- A) It is not yet known how Copernicus found astronomy texts from the Muslim world.
- B) Copernicus faced many obstacles from Christian religious authorities after he proposed his heliocentric theory.
- C) Copernicus's equations describing planetary motion are clearly based on the work of al-Tusi, a Maragha astronomer.
- D) Copernicus was almost certainly not able to read Persian or Arabic writings himself.

32

- A) NO CHANGE
- B) elaborated with
- C) elaborated for
- D) elaborated to

33

- A) NO CHANGE
- B) For most people,
- C) Afterward,
- D) For this reason,

Questions 34-44 are based on the following passage.

The Expanding Roles of Dietitians and Nutritionists

Dietitians are nutrition experts who help people plan healthy diets. Using their special knowledge and skills, dietitians ensure that their clients and patients eat nutritious foods and 34 living lifestyles that will help them be fit and healthy. Dietitians work in different settings depending on their specialty.

35 Some patients have medical conditions, like
36 the disorder known as celiac disease and high blood pressure, that impose dietary restrictions. They need help designing a healthy and varied diet that won't make 37 them sick. Other patients may simply need help selecting foods that promote good health. Elderly patients, for example, may need a diet that supports strong bones. Additionally, patients who have had surgery often experience a loss of appetite. They may need help to ensure that they are eating enough healthy food while they recover.

34

- A) NO CHANGE
- B) live
- C) to live
- D) lived

35

Which choice most effectively conveys the main topic of this paragraph?

- A) In most states, dietitians must meet certain licensure requirements before they can work in health care facilities.
- B) Clinical dietitians work with patients in hospitals and other health care facilities.
- C) Dietitians sometimes work in health care facilities; however, they are not doctors.
- D) Dietitians may offer specialized advice to some clients, but also agree on some broad rules; for instance, most people should avoid sugary soda.

36

- A) NO CHANGE
- B) the disorder of celiac disease
- C) celiac disease
- D) celiac disease, which limits dietary choices,

37

- A) NO CHANGE
- B) one
- C) us
- D) you

Other dietitians work outside of health care settings. Community dietitians work to encourage public health. They may visit schools to educate children on good nutrition or teach classes for adults living in 38 communities, with poor access to healthy groceries and fresh food. Sports dietitians collaborate with clients to help 39 <u>him</u> eat right to achieve their athletic goals. Research dietitians work at universities, where they study the effects of nutrients and diets on the body.

Aspiring dietitians usually earn a bachelor's degree in a field like biology, anatomy, or nutrition. 40 Regardless, many dietitians go on to earn master's degrees in a subfield. This education helps them 41 learn a lot of stuff about biology and chemistry to better understand the effects that nutrients can have on overall health. Dietitians must also 42 compliment this knowledge with good communication skills, since many interact one-on-one with patients or speak publicly to large groups.

38

- A) NO CHANGE
- B) communities; with poor access
- C) communities with poor access
- D) communities. With poor access

39

- A) NO CHANGE
- B) them
- C) her
- D) us

40

- A) NO CHANGE
- B) In addition,
- C) For example,
- D) Certainly,

41

Which of the following choices is most consistent with the style of the passage as a whole?

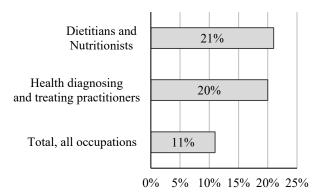
- A) NO CHANGE
- B) get really knowledgeable about
- C) develop a strong knowledge of
- D) read up on

42

- A) NO CHANGE
- B) complement
- C) condescend
- D) complicate

[1] There will probably be a high demand for dietitians in the coming years. [2] As the "baby boomer" generation of the United States ages, dietitians will play an important role in ensuring the health of the growing number of elderly Americans. [3] In addition, as the U.S. works to address its obesity epidemic, dietitians will be vital in treating and preventing obesity by helping Americans develop healthier diets. [4] By promoting proper nutrition, dietitians can help the "boomers" avoid some of the health problems linked with aging. [5] For these and other reasons, the U.S. Bureau of Labor Statistics predicts 43 a 20% increase in the number of dietitians and nutritionists by 2022. 40

Dietitians and Nutritionists
Percent change in employment, projected
2012-2022



43

- A) NO CHANGE
- B) an 11% increase in the number of dietitians and nutritionists
- C) that 21% of all workers will be dietitians or nutritionists
- D) a 21% increase in the number of dietitians and nutritionists

44

For the sake of the cohesion of this paragraph, sentence 4 should be placed

- A) where it is now.
- B) after sentence 1.
- C) after sentence 2.
- D) after sentence 5.

STOP

If you complete this section before the end of your allotted time, you may check your work on this section only. Do NOT use the time to work on another section.

Math Test – No Calculator

15 MINUTES, 10 QUESTIONS

Turn to Section 3 of your answer sheet to answer the questions in this section.

DIRECTIONS

Questions 1-7 ask you to solve a problem, select the best answer among four choices, and fill in the corresponding circle on your answer sheet. Questions 8-10 ask you to solve a problem and enter your answer in a grid provided on your answer sheet. There are detailed instructions on entering answers into the grid on the following page. You may use your test booklet for scratch work.

NOTES

- 1. You **may not** use a calculator.
- 2. Variables and expressions represent real numbers unless stated otherwise.
- 3. Figures are drawn to scale unless stated otherwise.
- 4. Figures lie in a plane unless stated otherwise.
- 5. The domain of a function f is defined as the set of all real numbers x for which f(x) is also a real number, unless stated otherwise.

REFERENCE



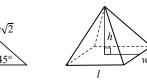
 $A = \frac{1}{2} bh$



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



Special Triangles







A = lw



V = lwh



 $V = \pi r^2 h$



 $C = 2\pi r$



There are 360° in a circle.

The sum of the angles in a triangle is 180°.

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

If 42 = 3(x - 4), what is the value of x?

- A)
- B) 10
- C) 18
- D) 20

2

For what value of k does $x^2 + kx + 9 = (x + 3)^2$?

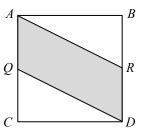
- A) 0
- B) 3
- C) 6
- D) 9

3

A barrel of crude oil is extracted from shale at a cost of \$51, and then transported to and from the refinery at a cost of \$6 each direction. Oil is processed three times at the refinery plant, at a cost of \$9 each time. What is the profit, in dollars per barrel, if one barrel is sold for \$93? (Profit is equal to revenue minus expenses.)

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

38



The square above has an area of 100. If Q is the midpoint of \overline{AC} and R is the midpoint of \overline{BD} , what is the area of the shaded region?

- A) 40
- B) 50
- C) 60
- D) 75

5

$$\frac{2x}{x-1} - \frac{3x}{x+1}$$

Which of the following expressions is equivalent to the expression above?

A)
$$-\frac{x}{x^2-1}$$

B)
$$\frac{5x-x^2}{x^2-1}$$

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

D)
$$-\frac{6x}{x^2 - 1}$$

$$|x-3| \leq 5$$

Which of the following inequalities is equivalent to the absolute value inequality above?

- A) $-2 \le x \le 8$
- B) $-8 \le x \le 2$
- C) $x \le -2$ or $x \ge 8$
- D) $x \le -8$ or $x \ge 2$

7

The sum of a and b is 132. If a is the square of b and the product of a and b is negative, what is a?

- A) -12
- B) 11
- C) 121
- D) 144

DIRECTIONS

Questions 8-10 ask you to solve a problem and enter your answer in the grid provided on your answer sheet. When completing grid-in questions:

- 1. You are required to bubble in the circles for your answers. It is recommended, but not required, that you also write your answer in the boxes above the columns of circles. Points will be awarded based only on whether the circles are filled in correctly.
- 2. Fill in only one circle in a column.
- 3. You can start your answer in any column as long as you can fit in the whole answer.
- 4. For questions 8-10, no answers will be negative numbers.
- 5. Mixed numbers, such as $4\frac{2}{5}$, must be gridded as decimals or improper fractions, such as 4.4 or as 22/5. "42/5" will be read as "forty-two over five," not as "four and two-fifths."
- 6. If your answer is a **decimal** with more digits than will fit on the grid, you may round it or cut it off, but you must fill the entire grid.
- 7. If there are multiple correct solutions to a problem, all of them will be considered correct. Enter only one on the grid.

5 / 1 1	8 . 4	3 / 7
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. 0000	. $\bigcirc\bigcirc\bigcirc\bigcirc\bigcirc\bigcirc$. 0000
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1 \(\c) \(\left\)	1 \(\) \(\) \(\)	1 0 0 0 0
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3 0 0 0 0	3 \(\cap \)	3 () • () ()
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6 0 0 0 0	6 0 0 0 0	6 0 0 0 0
7 0 0 0 0	7 0 0 0 0	7 ○ ○ ○ ●
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9 0 0 0 0	9 0000	9 0 0 0 0

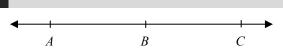
. 4 2 2	. 3 2 6	. 1 2 5
/ 00	/ 00	/ 00
\cdot \bullet \circ \circ	. \bullet \circ \circ	. \bullet \circ \circ
0 0 0 0 0	0 0 0 0 0	0 0 0 0 0
1 0 0 0 0	1 0 0 0 0	1 (• ()
2 ○ ○ ● ●	2 ○ ○ ● ○	$2 \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc$
3 \(\cap \)	3 ○ ● ○ ○	3 \(\cap \)
4 \(\cdot \c	4 \(\) \(\) \(\)	4 \(\) \(\) \(\)
5 \(\cap \)	5 \(\cap \)	5 ○ ○ ○ ●
6 0 0 0 0	6 ○ ○ ○ ●	6 0 0 0 0
7 0 0 0 0	7 0 0 0 0	7 0 0 0 0
8 0 0 0 0	8 0 0 0 0	8 \(\cap \)
9 0 0 0 0	9 0 0 0 0	9 0 0 0 0

A stone is dropped from a height of 9 meters above the ground. If the height function can be modeled by the equation $h(t) = a - t^2$, where t is time in seconds, h is height in meters, and a is the initial height, how many seconds does it take for the stone to hit the ground?

10

The imaginary number *i* is defined such that $i^2 = -1$. What is the value of $(1 - i\sqrt{5})(1 + i\sqrt{5})$?

9



A, B, and C lie on a line, as shown above. The length of \overline{AB} is x - 4 and the length of \overline{AC} is x + 6. What is the length of \overline{BC} ?

STOP

If you complete this section before the end of your allotted time, check your work on this section only. Do NOT use the time to work on another section.

Section 4

Math Test - Calculator

30 MINUTES, 20 QUESTIONS

Turn to Section 4 of your answer sheet to answer the questions in this section.

DIRECTIONS

Questions **1-16** ask you to solve a problem, select the best answer among four choices, and fill in the corresponding circle on your answer sheet. Questions **17-20** ask you to solve a problem and enter your answer in a grid provided on your answer sheet. There are detailed instructions on entering answers into the grid on the following page. You may use your test booklet for scratch work.

NOTES

- 1. You **may** use a calculator.
- 2. Variables and expressions represent real numbers unless stated otherwise.
- 3. Figures are drawn to scale unless stated otherwise.
- 4. Figures lie in a plane unless stated otherwise.
- 5. The domain of a function f is defined as the set of all real numbers x for which f(x) is also a real number, unless stated otherwise.

REFERENCE



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

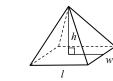


 $a^2 + b^2 = c^2$



x√3

Special Triangles



 $V = \frac{1}{3} lwh$



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



A = lw



V = lwh



 $V = \pi r^2 h$



 $C = 2\pi r$



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

There are 360° in a circle.

The sum of the angles in a triangle is 180°.

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

If y = x - 2, and x = 2y + 4, what is the value of x?

- A)
- B) 0
- C) -2
- D) -6

x	0	2	4	6
f(x)	3	4	5	6

Which of the following expressions defines f(x) in the table above?

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

46

3

If a farmer in Kansas purchases 8 pigs for every 1.5 acres of land and has 6 acres of land set aside for pigs, how many pigs will she purchase?

- A) 20
- B) 32
- C) 40
- D) 48

4

$$\frac{x-1}{3} = \frac{2x-6}{4}$$

What is the value of x that satisfies the equation above?

- 5 A)
- 7 B)
- 8 C)
- D) 16

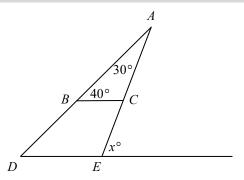
5

The population of an invasive species of moth doubles every 5 years. If the initial population is 300, what will be the population after 15 years?

- 900 A)
- B) 1200
- C) 2000
- D) 2400

4

6



In the figure above, if $\overline{BC} \parallel \overline{DE}$, what is the value of x?

- A) 30
- B) 40
- C) 70
- D) 110

7

Ali buys 10 burgers and 7 chocolate milkshakes for \$50.95. If the price of a chocolate milkshake is \$0.25 cheaper than the price of a burger, what is the price of a chocolate milkshake?

- A) \$2.85
- B) \$3.10
- C) \$4.05
- D) \$5.09

8

The acute angles of a right triangle have a ratio of 12 to 3. What is the difference between the two angle measures?

- A) 42 degrees
- B) 54 degrees
- C) 64 degrees
- D) 72 degrees

9

$$x^2 - 1 < x^3$$

For which of the following values is the above inequality true?

- A) x = -3
- B) x = -2
- C) x = -1
- D) x = 0

10

$$x = 12$$

$$3x = 4y^2$$

In the system of equations above, if y > 0, what is the value of x^2y ?

- A) 36
- B) 108
- C) 432
- D) 1296

Three different integers are randomly selected from a group of five unique integers consisting of 1 through 5. What is the probability that these numbers are 1, 2, and 3?

- A) One in five
- B) One in ten
- C) One in twenty
- D) One in sixty

12

The ratio of d:c is 3:1. If the sum of d and c is s, what is the value for d, in terms of s?

- A) $\frac{4}{3}s$
- C) s-3
- D) s-4

13

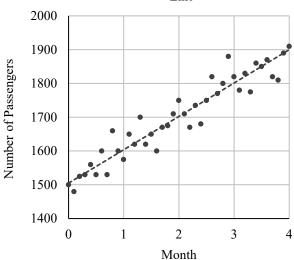
Cups of Coffee (per day)					
Student Year	0	1	2 or more	Total	
Freshman	25	9	16	50	
Sophomore	5	19	26	50	
Junior	10	6	50	66	
Senior	0	2	32	34	
Total	40	36	124	200	

A survey on coffee consumption was conducted among a random sample of students at a university. The results are shown in the table above. Which of the following statements about the students surveyed is NOT supported by the table?

- A) A higher percentage of juniors than sophomores drink 2 or more cups of coffee per day.
- B) A higher percentage of juniors than seniors drink 2 or more cups of coffee per day.
- C) 20% of all students surveyed do not drink coffee.
- D) 50% of the freshmen do not drink coffee.

14

Number of Passengers Using the Commuter Line



The graph above shows the number of passengers on a train line over 4 months. If *m* is the number of months, which of the following functions best represents the graph's line of best fit?

A)
$$f(m) = 200 + 1500m$$

B)
$$f(m) = 150 + 100m$$

C)
$$f(m) = 1500 + 100m$$

D)
$$f(m) = 150m + 1500$$

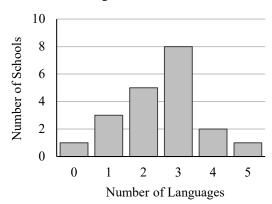
15

j is equal to 925 and *k* is equal to 5,550. A number, *n*, is added to *j*, such that the ratio of j + n to *k* is 1:3. What is the ratio of *n* to j + n, expressed as a percentage of j + n?

- A) 30%
- B) 40%
- C) 50%
- D) 60%

16

Number of Foreign Languages Offered in a High School Curriculum



Twenty high schools were surveyed on the number of languages offered in their curriculum. The results are shown in the chart above. How many schools offer fewer languages than average across the 20 schools?

- A) 9
- B) 10
- C) 11
- D) 17

DIRECTIONS

Questions 17-20 ask you to solve a problem and enter your answer in the grid provided on your answer sheet. When completing grid-in questions:

- 1. You are required to bubble in the circles for your answers. It is recommended, but not required, that you also write your answer in the boxes above the columns of circles. Points will be awarded based only on whether the circles are filled in correctly.
- 2. Fill in only one circle in a column.
- 3. You can start your answer in any column as long as you can fit in the whole answer.
- 4. For questions17-20, no answers will be negative numbers.
- 5. Mixed numbers, such as $4\frac{2}{5}$, must be gridded as decimals or improper fractions, such as 4.4 or as 22/5. "42/5" will be read as "forty-two over five," not as "four and two-fifths."
- 6. If your answer is a **decimal** with more digits than will fit on the grid, you may round it or cut it off, but you must fill the entire grid.
- 7. If there are multiple correct solutions to a problem, all of them will be considered correct. Enter only one on the grid.

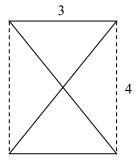
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9 0 0 0 0	9 0 0 0 0	9 0 0 0 0

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3 0 0 0 0	3 ○ ● ○ ○	3 () () ()
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6 0 0 0 0	6 ○ ○ ○ ●	6 0 0 0 0
7 0 0 0 0	7 0 0 0 0	7 0 0 0 0
8 0 0 0 0	8 \(\cap \)	8 \(\cap \)
9 0 0 0 0	9 0 0 0 0	9 0 0 0 0

$$-15(2 + n) = -16(n - 7)$$

What is the value of n in the equation above?

18



A rectangle has side lengths 3 and 4 as shown in the figure above. What is the total length of the solid lines?

Questions 19 and 20 refer to the following information.

Boyle's law states that at a constant temperature, the pressure and volume of any gas are inversely proportional. The law is written according to the equation PV = k, where P is the pressure of a gas, V is the volume of the gas, and k is a constant. In laboratories, a cylindrical syringe with a rubber stopper can be used to contain the gas, as shown in the diagram below.



19

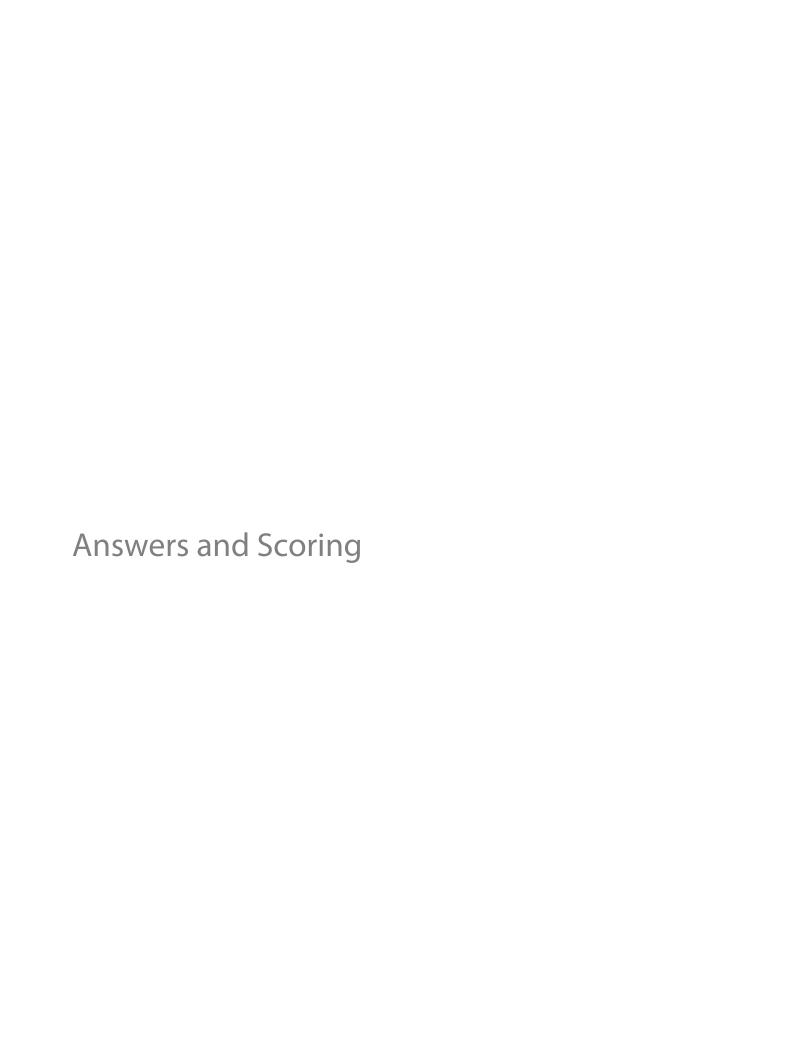
Gas is contained in a syringe with a rubber stopper at one end. The gas in the syringe initially has a pressure of 78 kilopascals, and a volume of 30 cubic centimeters. If the stopper is pushed down so that the gas takes up 20 cubic centimeters, what is the new pressure of the gas, in kilopascals?

20

A scientist inserts 50 cubic centimeters of gas into syringe A and 40 cubic centimeters of the same gas into syringe B, maintaining a pressure of 15.6 kilopascals in both syringes. He then applies a rubber stopper to the syringes' ends. If the scientist compresses both syringes to a volume of 30 cubic centimeters, what is the pressure of the gas in syringe B as a percentage of the pressure of the gas in syringe A? (Disregard the percent symbol when gridding your answer.)

STOP

If you complete this section before the end of your allotted time, check your work on this section only. Do NOT use the time to work on another section.



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USC

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MIT

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Johns Hopkins University Northwestern University

Georgetown University

Rice University Washington University Yale University

University of Pennsylvania

Cornell University Brown University

Emory University

University of Chicago

Tufts University

Carnegie Mellon University

Boston College Vanderbilt University

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Answers

Part 1

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Section 1				
1. A	7. D	13. C	19. B	25. B
2. C	8. A	14. D	20. D	26. A
3. B	9. C	15. D	21. C	27. A
4. C	10. A	16. A	22. B	28. B
5. D	11. C	17. D	23. C	29. D
6. B	12. A	18. B	24. D	30. C
Section 2				
1. A	10. C	19. C	28. C	37. A
2. A	11. B	20. B	29. D	38. C
3. D	12. B	21. D	30. B	39. B
4. A	13. D	22. A	31. C	40. B
5. A	14. C	23. C	32. A	41. C
6. D	15. C	24. C	33. D	42. B
7. C	16. A	25. D	34. B	43. D
8. B	17. A	26. B	35. B	44. C
9. D	18. B	27. C	36. C	
Section 3				
1. C	3. C	5. B	7. D	9. 10
2. C	4. B	6. A	8. 3	10. 6
Section 4				
1. B	5. D	9. D	13. B	17. 142
1. Б	J. D	9. D	13. Б	17. 142

10. C

11. B

12. B

2. B

3. B

4. B

6. C

7. A

8. B

14. C

15. C

16. A

18. 16

19. 117

20. 80

Ivy Global

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Since 2007, Ivy Global has provided premium consulting services for prospective students applying to top private schools and US colleges. With offices in New York, Silicon Valley and Toronto, we have helped thousands of students maximize their educational opportunities in North America and abroad.

Scoring Your Test

Part 2

To score your tests, first use the answer key to mark each of your responses right or wrong. Then, calculate your raw score for each section by counting up the number of correct responses. For the Extended Thinking question in the Math Calculator Section, give yourself 2 points for each part answered correctly. Use the tables below to help you calculate your scores:

	Raw Score		
Section	# of Questions Correct		Total Points
1. Reading		× 1 =	
2. Writing		× 1 =	
3 & 4. Math		× 1 =	
Raw Score for Reading (Section 1):			
Raw Score for Writing (Section 2):			
Raw Score for Math (Sections 3 & 4):			

56

Scaled Scores

Once you have found your raw score for each section, convert it into an approximate **scaled test score** using the charts below. To find a scaled test score for each section, find the row in the Raw Score column which corresponds to your raw score for that section, then check the column for the section you are scoring in the same row. For your final Reading and Writing Score, add your scaled scores for those sections together and multiply the result by 10. For example, if you got a score of 31 on the Writing section and a 37 on the Reading section, you would have a scaled score of 680. Keep in mind that these scaled scores are only estimates from a small set of questions. We recommend taking a full diagnostic test to get an accurate assessment.

Raw Score	Writing Scaled Score	Math Scaled Score	Reading Scaled Score	Raw Score	Writing Scaled Score	Math Scaled Score	Reading Scaled Score
44	40			21	23	610	31
43	39			20	23	600	30
42	38			19	22	580	29
41	37			18	21	570	28
40	36			17	21	550	27
39	35			16	20	540	26
38	34			15	19	520	25
37	34			14	19	510	25
36	33			13	18	500	24
35	32			12	17	480	23
34	32			11	16	470	22
33	31			10	16	440	21
32	30			9	15	430	20
31	30			8	14	390	19
30	29	800	40	7	13	380	18
29	29	770	39	6	13	340	17
28	28	750	38	5	12	330	16
27	27	710	37	4	11	310	15
26	26	700	36	3	10	280	14
25	26	680	35	2	10	240	12
24	25	670	33	1	10	210	10
23	25	650	32	0	10	200	10
22	24	630	32				

Use the table below to record your scaled scores:

Scaled Scores	
Scaled Score for Reading & Writing (Out of 800):	
Scaled Score for Math (Out of 800):	