The New York City Department of Education

2021 Specialized High School Admissions Test

GENERAL DIRECTIONS

Student Name: _____

Identifying Information

Turn to Side 1 of the answer sheet.

Notify the proctor immediately if you are ill or should not be taking this test. Do not sign the statement or begin the test. Return your answer sheet to the proctor.

Line 1: Read the statement and sign your name in the space following the word "signature." Do not print your name.

Line 2: Print today's date, using the numbers of the month, the day, and the year.

Line 3: Print your birth date with the number of the month first, then the number of the day, then the last two digits of the year. For example, a birth date of March 1, 2005, would be 3-1-05.

Grid 4: Print the letters of your first name, or as many as will fit, in the boxes. Write your name exactly as you did on the application. If you have a middle initial, print it in the box labeled "MI." Then print the letters of your last name, or as much as will fit, in the boxes provided. Below each box, fill in the circle that contains the same letter as the box. If there is a space or a hyphen in your name, fill in the circle under the appropriate blank or hyphen.

Make dark marks that completely fill the circles. If you change a mark, be sure to erase the first mark completely.

Grid 5: Carefully copy the order in which you ranked the specialized high schools on your Test Ticket onto Grid 5. If Grid 5 is not marked correctly, your admission to a specialized high school will be affected because your admission is based on the score you achieve and the order in which you rank your school preferences in this grid. The school choices indicated on your answer sheet are final.

Fill in one and only one circle for each school for which you wish to be considered. You may make as few as one or as many as eight choices. To increase your chances of being assigned to one of the specialized high schools, you are encouraged to make more than one choice. You **must** fill in a first choice school. Do not fill in a school more than once. Do not fill in the same school for each choice. Fill in only one circle in a row and only one circle in a column.

Grid 6: Complete the grid with your date of birth. Print the first three letters of the month in the first box, the number of the day in the next box, and the year in the last box. Then fill in the corresponding circles.

Grid 7:

1. Print the name of the school where you are now enrolled in the space at the top of the grid.
2. In the boxes marked "SCHOOL CODE," print the six-digit code that identifies your school and fill in the circle under the corresponding number or letter for each digit of the school code. (You can find your school code on your Test Ticket. If it is not there, tell the proctor, and the proctor will get the school code for you.)
3. If you attend a private or parochial school, fill in the circle marked "P."

Grid 8: Print your student ID number in Grid 8. You can find your student ID number on your Test Ticket. In the boxes, print your nine-digit student ID number. Below each box, fill in the circle containing the same number as in the box.

DO NOT OPEN THIS BOOKLET
UNTIL YOU ARE TOLD TO DO SO.

TURN YOUR BOOKLET OVER TO THE BACK COVER.

START SHSAT PREP

Identifying Information, continued

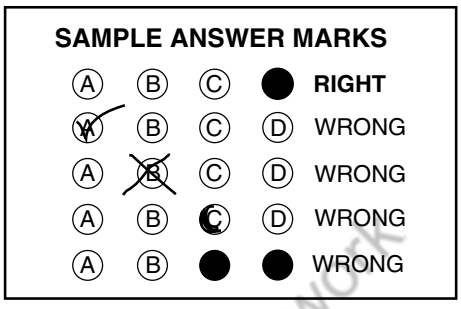
Grid 9: In most cases, Grid 9 is already filled in for you. If it is not, copy the letter and numbers shown in the upper-right corner of your test booklet into the boxes. Below each box, fill in the circle containing the same letter or number as the box.

Now review Side 1 to make sure you have completed all lines and grids correctly. Review each column to see that the filled-in circles correspond to the letters or numbers in the boxes above them.

Turn your answer sheet to Side 2. Print your test booklet letter and numbers, and your name, first name **first**, in the spaces provided.

Marking Your Answers

Mark each of your answers on the answer sheet in the row of circles corresponding to the question number printed in the test booklet. Use only a Number 2 pencil. If you change an answer, be sure to erase it completely. Be careful to avoid making any stray pencil marks on your answer sheet. Each question has only one correct answer. If you mark more than one circle in any answer row, that question will be scored as incorrect.



You can use your test booklet or the provided scrap paper to take notes or solve questions; however, your answers must be recorded on the answer sheet in order to be counted. **You will not be able to mark your answers on the answer sheet after time is up, and answers left in the test booklet will not be scored.**

DO NOT MAKE ANY MARKS ON YOUR ANSWER SHEET OTHER THAN FILLING IN YOUR ANSWER CHOICES.

Planning Your Time

You have 180 minutes to complete the entire test. **How you allot the time between the English Language Arts and Mathematics sections is up to you.** If you begin with the English Language Arts section, you may go on to the Mathematics section as soon as you are ready. Likewise, if you begin with the Mathematics section, you may go on to the English Language Arts section as soon as you are ready. If you complete the test before the allotted time (180 minutes) is over, you may go back to review questions in either section.

Be sure to read the directions for each section carefully. Each question has only one correct answer. Choose the best answer for each question. When you finish a question, go on to the next, until you have completed the last question. Your score is determined by the number of questions you answer correctly. **Answer every question, even if you may not be certain which answer is correct.** Don't spend too much time on a difficult question. Come back to it later if you have time. If time remains, you should check your answers.

Students must stay for the entire test session.

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO

B

1123351 1 2 3 4 5 A B C D E Printed in the USA ISD32507

START SHSAT PREP

Sample Test, Form B

Part 1 — English Language Arts

57 Questions

Revising/Editing

QUESTIONS 1-9 (PART A AND PART B)

REVISING/EDITING PART A

DIRECTIONS: Read and answer the following questions. You will be asked to recognize and correct errors so that the sentences or short paragraphs follow the conventions of standard written English. You may write in your test booklet as needed to take notes. You should reread relevant parts of the sentences or paragraphs, while being mindful of time, before marking the best answer for each question.

1. Which revision corrects the error in sentence structure in the paragraph?

> The land on Earth has not always been separated into the seven continents, at one time a massive supercontinent, known as Pangaea, covered one-third of Earth's surface. Additionally, the supercontinent was surrounded by ocean waters called Panthalassa, much of which were in Earth's Southern Hemisphere. Geologists believe that the supercontinent split apart over millions of years because of the movement of the tectonic plates that form Earth's crust. In fact, experts predict that over the next 250 million years the movement of the plates will cause the seven continents to merge into a supercontinent again.

A. continents. At

B. surface; additionally,

C. Panthalassa. Much

D. crust, in fact,

START SHSAT PREP

2. Which sentence contains an error in its construction and should be revised?

(1) Walking dogs, cleaning kennels, hand-feeding newborn kittens, and supporting the pet-adoption process, the animal shelter is looking for volunteers to help with a variety of tasks. (2) Working at the animal shelter is a great way for young people, especially those who aspire to care for and protect animals, to gain valuable work experience. (3) In addition to hands-on training with animal care, volunteers will learn important job skills, such as punctuality, responsibility, and personal initiative. (4) Caring for animals can also help volunteers develop empathy, which is the awareness and understanding of the feelings of others.

E. sentence 1

F. sentence 2

G. sentence 3

H. sentence 4

3. Which edit should be made to correct the sentence?

The Colosseum in Rome, Italy which is considered one of the "new" Seven Wonders of the World, is the largest amphitheater ever built and once could hold up to 50,000 spectators.

A. Delete the comma after ***Rome***.

B. Insert a comma after ***Italy***.

C. Delete the comma after ***World***.

D. Insert a comma after ***built***.

START SHSAT PREP

4. How should this sentence be revised?

> To promote their club, a bake sale will be sponsored by members of the debate team on Wednesday.

E. To promote their club, on Wednesday a bake sale will be sponsored by members of the debate team.

F. On Wednesday, to promote their club, a bake sale will be sponsored by members of the debate team.

G. To promote their club, members of the debate team will sponsor a bake sale on Wednesday.

H. Members of the debate team, on Wednesday to promote their club, will sponsor a bake sale.

START SHSAT PREP

REVISING/EDITING PART B

DIRECTIONS: Read the text below and answer the questions following it. You will be asked to improve the writing quality of the text and to correct errors so that the text follows the conventions of standard written English. You should reread relevant parts of the text, while being mindful of time, before marking the best answer for each question.

The Free College Debate

(1) A college degree has become an essential tool in an increasingly competitive job market. (2) Yet, the price of higher education, at both private and public universities, continues to rise. (3) Helping students cover the cost of attending college is an important issue.

(4) Many people agree that a college education should be a financially realistic option for those who aspire to obtain a degree. (5) For example, in 2017, the New York State legislature passed a bill creating a program to cover the tuition costs for nearly one million students. (6) The state of Tennessee also has a program that offers all students scholarships and mentoring services if they attend one of the state's community colleges. (7) Proponents generally believe that these programs are a step in the right direction for making college affordable for students who would have had to take out loans or who would have decided not to pursue higher education at all.

(8) On the other hand, some people oppose bills like the ones in New York and Tennessee because they believe "free" college programs are unsustainable. (9) In order to implement these types of programs, a state pays the college on behalf of the students using funds from the state's budget, which primarily comes from state taxes. (10) As more students choose to attend college, more funds will be needed to cover the costs. (11) Additionally, many students do not finish college within four years because they switch majors or because they have to work. (12) Critics believe that these circumstances will inevitably lead to an increase in taxes, a decline in the quality of the education offered by the schools, or both. (13) They think narrower college-affordability efforts that target the students who need the most support, such as first-generation college students, may be more effective and viable solutions.

(14) Faculty and students at higher-education institutions can work to keep costs down. (15) In light of increased access to computers, mobile devices, and the Internet, there are more opportunities for students to take courses online, thus reducing the need for and cost of maintaining physical classrooms. (16) Additionally, colleges should account for experience by allowing students to demonstrate their knowledge in order to avoid having to pay to sit through classes on subjects they have already mastered. (17) Similarly, college-bound high school students need to be prepared for college-level work so that they do not have to spend money on remedial classes.

(18) The solutions to the problems associated with rising college costs are not simple. (19) Passing legislation that boosts college affordability will take time, input from experts with different ideas, and careful planning.

START SHSAT PREP

5. Which sentence should replace sentence 3 to best state the topic of the passage?

A. Several states have implemented scholarship programs that allow students to attend public universities and community colleges at a very low tuition rate or for free.

B. Determining the most effective way to make college affordable is a complex issue, and there are differing opinions about how to approach the problem.

C. Higher-education institutions should reduce the cost of a college education by finding ways to help students avoid paying for unnecessary classes and materials.

D. The main concern related to the issue of college affordability is that helping students cover tuition could affect the quality of the education they receive.

6. Read this sentence.

> Some note that several states have made their community or state colleges low-cost or free for students with limited resources.

Where should the sentence be added to best support the ideas in the second paragraph (sentences 4–7)?

E. at the beginning of the paragraph (before sentence 4)

F. between sentences 4 and 5

G. between sentences 5 and 6

H. between sentences 6 and 7

7. Which sentence presents information that shifts away from the topic of the third paragraph (sentences 8–13) and should be deleted?

A. sentence 10

B. sentence 11

C. sentence 12

D. sentence 13

START SHSAT PREP

If you have ever watched someone fall on icy ice, you've seen slipperiness at work. But have you wondered what makes ice slippery, or why skates or skis glide across ice so easily? The answer might seem obvious: ice is smooth. Yet smoothness in itself does not explain slipperiness. Imagine, for example, skating on a smooth surface of glass or sheet metal.

Surprisingly, scientists do not fully understand why ice is slippery. Past explanations of slipperiness have focused on friction and pressure. According to the friction theory, a skate blade rubs across the ice, causing friction. The friction produces heat, melting the ice and creating a slippery, microscopically thin layer of water for the skate to glide on. The friction theory, however, cannot explain why ice is slippery even when someone stands completely motionless on it.

The pressure theory claims that pressure from a skate blade lowers the ice's melting point, creating a slippery layer of water. Water normally melts when the pressure is lifted. Science textbooks typically cite this explanation, but many scientists disagree, claiming that the pressure effect is not great enough to melt the ice. Nor can the pressure theory explain why someone wearing flat-bottomed shoes—which have a greater surface area than skate blades and thus exert less pressure per square inch—can glide across the ice or even go sprawling.

During the 1990s, another theory found acceptance: the thin top layer of ice is liquid, or "liquid-like," regardless of friction or pressure. This notion was first proposed more than 150 years ago by physicist Michael Faraday. Faraday's simple experiment illustrates this property: two ice cubes held against each other will fuse together. This happens, Faraday explained, because liquid on the cubes' surfaces froze solid when the surfaces made contact.

Faraday's hypothesis was overlooked, in part because scientists did not have the means to detect molecular structures. However, technological advances during recent decades allow scientists to measure the thin layer on the surface of the ice. For example, in 1996, a chemist at Lawrence Berkeley Laboratory shot electrons at an ice surface and recorded how they rebounded. The data suggested that the ice surface remained "liquid-like," even at temperatures far below freezing. Scientists speculate that water molecules on the ice surface are always in motion because there is nothing above them to hold them in place. The vibration creates a slippery layer of molecules. According to this interpretation of the Lawrence Berkeley Laboratory experiments, the molecules move only up and down; if they also moved side to side, they would constitute a true

[illegible] slippery liquid-like surface [illegible] ice, although ice is the most common example. Lead crystals and even diamond crystals, made of carbon, also show this property [illegible] certain temperature and pressure conditions.

45. Which of the following best tells what this passage is about?

A. why ice surfaces are liquid-like
B. how ice changes from a solid to a liquid
C. answers to the question of what makes ice slippery
D. the discoveries of Michael Faraday
E. the processes of freezing and melting

CONTINUE ON TO THE NEXT PAGE ▶

Reading Comprehension

Questions 10–57

DIRECTIONS: Read each of the following six texts, and answer the related questions. You may write in your test booklet as needed to take notes. You should reread relevant parts of each text, while being mindful of time, before marking the best answer for each question. Base your answers only on the content within the text.

CONTINUE TO THE NEXT PAGE ►

Massachusetts: Lowell National Historical Park

1 During the first half of the 19th century, Lowell, Massachusetts, quickly transformed itself from a farm town to a bustling industrial city. In time, Lowell became a model of industry, gaining global recognition for its state-of-the-art technology, innovative canal and dam system, mill architecture, boardinghouses, churches, and ethnic neighborhoods. Young Yankee[1] women, immigrant families, and European tourists all flocked to Lowell to find work at one of the many textile mills, or visit the industrious city that was becoming a popular tourist destination. As one Scottish traveler observed during his visit to America, "Niagara[2] and Lowell are the two objects I will longest remember in my American journey, the one the glory of American scenery, the other of American industry." Today, Lowell National Historical Park welcomes visitors to enjoy the sights of Lowell and learn about the history of one of America's most significant industrial cities.

2 The Boston merchants who founded Lowell in 1821 and named it after Francis Cabot Lowell chose to locate the town along Massachusetts's Merrimack River to take advantage of the kinetic energy offered by the Pawtucket waterfalls. Over six miles of canals powered the waterwheels of Lowell's mills, whose massive five- and six-story brick buildings dominated the city's landscape. . . . The most recognized of these buildings are the Lowell Manufacturing Company chartered in 1821, the Suffolk or Wannalancit Mill completed around the 1880s, the Boott Mill Company established in 1835, and the Boott Mill Boardinghouse that opened in 1838. By the 1850s, 40 textile mills employing over 10,000 workers stretched for about a mile along the river. . . .

3 The city's female workforce was significant in the history of Lowell. From the early to mid-1800s, women left the constricted lifestyle of small rural towns and rural areas for independent industrial city life. Most were young single Yankee girls, who were tired of the limited opportunities offered by their domestic work.[3] Women found that Lowell's mills offered monthly wages for their services and provided them room and board. Although these women gained economic independence in Lowell, the mill boardinghouse keepers constantly supervised their social activities, for which they hardly had any time, considering their daily 12- to 14-hour work schedules. At the end of the day, the factory bell signaled the "mill girls" to return to their boardinghouses. They were expected to adhere to the strict code of conduct respecting curfew and attending church.

4 Yankee "mill girls" continued to dominate the Lowell workforce until the 1840s, when the city began to find it difficult to compete with the growing industrial development in other New England communities. As profits fell, the mill industry cut wages. These wage cuts, deteriorating working conditions, and long workdays led the "mill girls" to protest and organize strikes. When their demands went unheard, the women left Lowell, and immigrant groups replaced them in the workforce. Despite the low wages and unhealthy work conditions, immigrants were eager to find work.

5 The immigrants replacing the Yankee "mill girls" during the 1840s were predominantly Irish Catholics, who traveled to America during the Great Potato Famine. Although Lowell received an influx of Irish families during this time, the Irish were a part of the city's history from its birth,

---

[1]**Yankee:** native to New England

[2]**Niagara:** a town in northwestern New York State well known as the location of Niagara Falls, a series of waterfalls on the Canadian border

[3]**domestic work:** household duties like cooking and cleaning

and before the "mill girls" arrived, they built Lowell's historic canals, mills, and boardinghouses. Initially, Lowell's Protestant community was slow to welcome Irish immigrants, but the hostility between Yankee Protestants and Irish Catholics eventually disappeared. Irish immigrants dominated the industrial scene until the Civil War, when other immigrant groups began to work in the city mills.

6 Like the Irish, the French-Canadians, Greeks, Poles, Portuguese, Russian Jews, and Armenians who came to work in Lowell's mills faced long work hours, low wages, and poor living conditions in the city's crowded tenements. By the time Lowell's industry declined, the city had become an ethnic melting pot, where each group claimed its own distinct neighborhood, like the Irish immigrants' "New Dublin" or "Acre," and the French-Canadians' "Little Canada." The city officially began to close down its mills in the 1920s and '30s after Lowell's outdated mills could no longer compete against the state-of-the-art cotton mills in other communities and working conditions continued to decline as Lowell's companies stopped reinvesting in their mills. . . . Despite a brief resurgence during World War II, the city shut down its last surviving mill by the mid-1950s.

From "Massachusetts: Lowell National Historical Park"—Public Domain/National Park Service

10. Read this sentence from paragraph 1.

> **As one Scottish traveler observed during his visit to America, "Niagara and Lowell are the two objects I will longest remember in my American journey, the one the glory of American scenery, the other of American industry."**

The author most likely includes the quotation from the Scottish traveler in order to

E. suggest that people around the world saw the direct contribution of nature and industry to the United States.

F. compare the natural and industrial attractions in the United States at that time.

G. convey the idea that the United States offered both natural and industrial attractions.

H. imply that the natural resources in the United States contributed to the development of industry.

START SHSAT PREP

11. Which sentence from paragraph 2 best supports the idea that Lowell became "a bustling industrial city" (paragraph 1)?

A. "The Boston merchants who founded Lowell in 1821 and named it after Francis Cabot Lowell chose to locate the town along Massachusetts's Merrimack River to take advantage of the kinetic energy offered by the Pawtucket waterfalls."

B. "Over six miles of canals powered the waterwheels of Lowell's mills, whose massive five- and six-story brick buildings dominated the city's landscape."

C. "The most recognized of these buildings are the Lowell Manufacturing Company chartered in 1821, the Suffolk or Wannalancit Mill completed around the 1880s, the Boott Mill Company established in 1835, and the Boott Mill Boardinghouse that opened in 1838."

D. "By the 1850s, 40 textile mills employing over 10,000 workers stretched for about a mile along the river."

12. Read this sentence from paragraph 3.

> **From the early to mid-1800s, women left the constricted lifestyle of small rural towns and rural areas for independent industrial city life.**

Which statement best describes how the sentence fits into the overall structure of the passage?

E. It provides a transition from a description of the mills to a description of the workforce in those mills.

F. It indicates a shift in tone from positive and hopeful to negative and dissatisfied with working conditions at the mill.

G. It summarizes a challenge that led many women to leave their hometown and seek work in urban areas.

H. It begins a comparison of the mill workforce between the mid-1800s and the late 1800s.

13. Read this sentence from paragraph 5.

> **Although Lowell received an influx of Irish families during this time, the Irish were a part of the city's history from its birth, and before the "mill girls" arrived, they built Lowell's historic canals, mills, and boardinghouses.**

How does this sentence contribute to the development of ideas in the passage?

A. It implies that Lowell was founded by early Irish immigrants.

B. It emphasizes the important role Irish immigrants played in Lowell's history.

C. It suggests that the new Irish immigrants were readily accepted into the community.

D. It highlights the working relationship between the mill girls and the new Irish immigrants.

Excerpt from *A Tramp Abroad*

by Mark Twain

1 Now and then, while we[1] rested, we watched the laborious ant at his work. I found nothing new in him—certainly nothing to change my opinion of him. It seems to me that in the matter of intellect the ant must be a strangely overrated bird. During many summers now I have watched him, when I ought to have been in better business, and I have not yet come across a living ant that seemed to have any more sense than a dead one. I refer to the ordinary ant, of course; I have had no experience of those wonderful Swiss and African ones which vote, keep drilled armies, . . . and dispute about religion. Those particular ants may be all that the naturalist paints them, but I am persuaded that the average ant is a sham.

2 I admit his industry, of course; he is the hardest working creature in the world—when anybody is looking—but his leather-headedness is the point I make against him. He goes out foraging, he makes a capture, and then what does he do? Go home? No; he goes anywhere but home. He doesn't know where home is. His home may be only three feet away; no matter, he can't find it. He makes his capture, as I have said; it is generally something which can be of no sort of use to himself or anybody else; it is usually seven times bigger than it ought to be; he hunts out the awkwardest place to take hold of it; he lifts it bodily up in the air by main force, and starts—not toward home, but in the opposite direction; not calmly and wisely, but with a frantic haste which is wasteful of his strength; he fetches up against a pebble, and, instead of going around it, he climbs over it backwards, dragging his booty after him, tumbles down on the other side, jumps up in a passion, kicks the dust off his clothes, moistens his hands, grabs his property viciously, yanks it this way, then that, shoves it ahead of him a moment, turns tail and lugs it after him another moment, gets madder and madder, then presently hoists it into the air and goes tearing away in an entirely new direction; comes to a weed; it never occurs to him to go around it. No; he must climb it, and he does climb it, dragging his worthless property to the top—which is as bright a thing to do as it would be for me to carry a sack of flour from Heidelberg to Paris by way of Strasburg steeple; when he gets up there he finds that that is not the place; takes a cursory glance at the scenery, and either climbs down again or tumbles down, and starts off once more—as usual, in a new direction. At the end of half an hour he fetches up within six inches of the place he started from, and lays his burden down. Meantime, he has been over all the ground for two yards around, and climbed all the weeds and pebbles he came across. Now he wipes the sweat from his brow, strokes his limbs, and then marches aimlessly off, in as violent a hurry as ever. He traverses a good deal of zig-zag country, and by and by stumbles on his same booty again. He does not remember to have ever seen it before; he looks around to see which is not the way home, grabs his bundle, and starts. He goes through the same adventures he had before; finally stops to rest, and a friend comes along.

3 Evidently the friend remarks that a last year's grasshopper leg is a very noble acquisition, and inquires where he got it. Evidently the proprietor does not remember exactly where he did get it, but thinks he got it "around here somewhere." Evidently the friend contracts to help him freight it home. Then, with a judgment peculiarly antic (pun not intentional), they take hold of opposite ends of that grasshopper leg and begin to tug with all their might in opposite directions. Presently they take a rest, and confer together. They decide that something is wrong, they can't make out

[1] **we:** the author and his fictional travel companion

what. Then they go at it again, just as before. Same result. Mutual recriminations follow. Evidently each accuses the other of being an obstructionist. They warm up, and the dispute ends in a fight. They lock themselves together and chew each other's jaws for a while; then they roll and tumble on the ground till one loses a horn or a leg and has to haul off for repairs. They make up and go to work again in the same old insane way, but the crippled ant is at a disadvantage; tug as he may, the other one drags off the booty and him at the end of it. Instead of giving up, he hangs on, and gets his shins bruised against every obstruction that comes in the way. By and by, when that grasshopper leg has been dragged all over the same old ground once more, it is finally dumped at about the spot where it originally lay. The two perspiring ants inspect it thoughtfully and decide that dried grasshopper legs are a poor sort of property after all, and then each starts off in a different direction to see if he can't find an old nail or something else that is heavy enough to afford entertainment and at the same time valueless enough to make an ant want to own it. . . .

4 Science has recently discovered that the ant does not lay up anything for winter use. . . . He does not work, except when people are looking, and only then when the observer has a green, naturalistic look, and seems to be taking notes. This amounts to deception, and will injure him for the Sunday schools. He has not judgment enough to know what is good to eat from what isn't. This amounts to ignorance, and will impair the world's respect for him. . . . He cannot stroll around a stump and find his way home again. This amounts to idiocy, and once the damaging fact is established, thoughtful people will cease to look up to him. It is strange beyond comprehension that so manifest a humbug as the ant has been able to fool so many nations and keep it up so many ages without being found out.

From A TRAMP ABROAD by Mark Twain—Public Domain

17. The phrase "those wonderful Swiss and African ones which vote, keep drilled armies, . . . and dispute about religion" in paragraph 1 shows that the author

A. believes that the behavior of the ants is reflected in other living creatures.

B. acknowledges that his observations of a few do not necessarily apply to all.

C. knows that disproving a commonly held belief is challenging.

D. accepts that there are flaws in his interpretation of the behavior of the ants.

18. In paragraph 2, how do the words "grabs," "yanks," and "tearing away" contribute to the meaning of the excerpt?

E. They highlight the ant's belief that his work is important.

F. They illustrate that the ant is more efficient working on his own.

G. They indicate the speed with which the ant completes his tasks.

H. They emphasize the ant's anxious efforts to be productive.

If you have ever watched someone fall on the ice, you've seen slipperiness at work. But have you wondered what makes ice slippery, or why skates or skis glide across ice so easily? The answer might seem obvious: ice is smooth. Yet smoothness in itself does not explain slipperiness. Imagine, for example, skating on a smooth surface of glass or sheet metal.

Surprisingly, scientists do not fully understand why ice is slippery. Past explanations of slipperiness have focused on friction and pressure. According to the friction theory, a skate blade rubs across the ice, causing friction. The friction produces heat, melting the ice and creating a slippery, microscopically thin layer of water for the skate to glide on. The friction theory, however, cannot explain why ice is slippery even when a skater stands perfectly motionless, creating no friction.

The pressure theory holds that pressure from a skate blade melts the ice surface, creating a slippery layer of water. The water refreezes when the pressure is lifted. Science textbooks typically cite this explanation, but many scientists disagree, claiming that the pressure effect is not great enough to melt the ice. Nor can the pressure theory explain why someone wearing flat-bottomed shoes—which have a greater surface area than skate blades and thus exert less pressure per square inch—can glide across the ice or even go sprawling.

During the 1990s, another theory found acceptance: the thin top layer of ice is liquid, or "liquid-like," regardless of friction or pressure. This notion was first proposed more than 150 years ago by physicist Michael Faraday. Faraday's simple experiment illustrates this property: two ice cubes held against each other will fuse together. This happens, Faraday explained, because liquid on the cubes' surfaces froze solid when the surfaces made contact.

Faraday's hypothesis was overlooked, in part because scientists did not have the means to detect molecular structures. However, technological advances during recent decades allow scientists to measure the thin layer on the surface of the ice. For example, in 1996, a chemist at Lawrence Berkeley Laboratory shot electrons at an ice surface and recorded how they rebounded. The data suggested that the ice surface remained "liquid-like," even at temperatures far below freezing. Scientists speculate that water molecules on the ice surface are always in motion because there is nothing above them to hold them in place. The vibration creates a slippery layer of molecules. According to this interpretation of the Lawrence Berkeley Laboratory experiments, the molecules [illegible] liquid. Thus it could be said that people are [illegible] molecules!

The phenomenon of a slippery liquid-like surface is not limited to ice, although ice is the most common example. Lead crystals and even diamond crystals, made of carbon, also show this property at certain temperature and pressure conditions.

45. Which of the following best tells what this passage is about?

A. why ice surfaces are liquid-like
B. how ice changes from a solid to a liquid
C. answers to the question of what makes ice slippery
D. the discoveries of Michael Faraday
E. the processes of freezing and melting

CONTINUE ON TO THE NEXT PAGE ▶

23. Which of the following best explains the author's fascination with the ants?

A. "During many summers now I have watched him, when I ought to have been in better business, and I have not yet come across a living ant that seemed to have any more sense than a dead one." (paragraph 1)

B. "I admit his industry, of course; he is the hardest working creature in the world—" (paragraph 2)

C. "Science has recently discovered that the ant does not lay up anything for winter use." (paragraph 4)

D. "It is strange beyond comprehension that so manifest a humbug as the ant has been able to fool so many nations and keep it up so many ages without being found out." (paragraph 4)

24. Read this sentence from paragraph 3.

> **Evidently the friend remarks that a last year's grasshopper leg is a very noble acquisition, and inquires where he got it.**

Which statement best describes how the sentence fits into the overall structure of the excerpt?

E. It indicates a shift to the realization that the ants place great importance on an item that has little value.

F. It emphasizes a shift from an analysis of the actions of the individual ant to an interpretation of the interaction between ants.

G. It introduces a transition to the idea that specific observations about one ant allow for generalizations about all ants.

H. It provides a transition to the observation that the ant's friend is just as purposeful in his efforts toward a futile ending as the first ant is.

25. The central idea that "the average ant is a sham" (paragraph 1) is conveyed mainly through the

A. comical descriptions of the inability of the ants to accomplish the task at hand.

B. comparison between ants from other countries and the ants being observed.

C. keen observations that the level of intelligence of ants is mostly overstated.

D. conclusion that ants value objects that are of little practical use to them.

START SHSAT PREP

Using Fire to Keep a Prairie Healthy

1 Inside the 40,000-acre Joseph H. Williams Tallgrass Prairie Preserve in northern Oklahoma, herds of bison roam on the scenic land that is home to hundreds of different species of plants and animals. While one of the greatest threats to the prairie is wildfire, the use of controlled fires is actually an effective way to protect this idyllic landscape.

2 Fires that are started by lightning or other natural circumstances are inevitable, and the results can be disastrous. However, hundreds of years ago the American Indian people who inhabited the Great Plains area between Minnesota and Texas realized that these fires could also be helpful. The bison in the area seemed to prefer grazing on tender new grass on the recently burned land rather than on grass in the unburned areas. The American Indian people began to deliberately burn areas of land for bison to graze on, which enticed the herds away from the people's crops.

3 Today conservationists at the Tallgrass Prairie Preserve and farmers in the Great Plains continue to use controlled burns for land management. Intentionally burning a portion of land can dramatically improve the quality of the vegetation that regrows there. The fires burn away weedy undergrowth and help limit the overcrowding of shrubs and trees in the burn area, creating less competition for water and nutrients. Additionally, the process of burning excess plant matter adds nitrogen, an essential element for plant growth, to the soil.

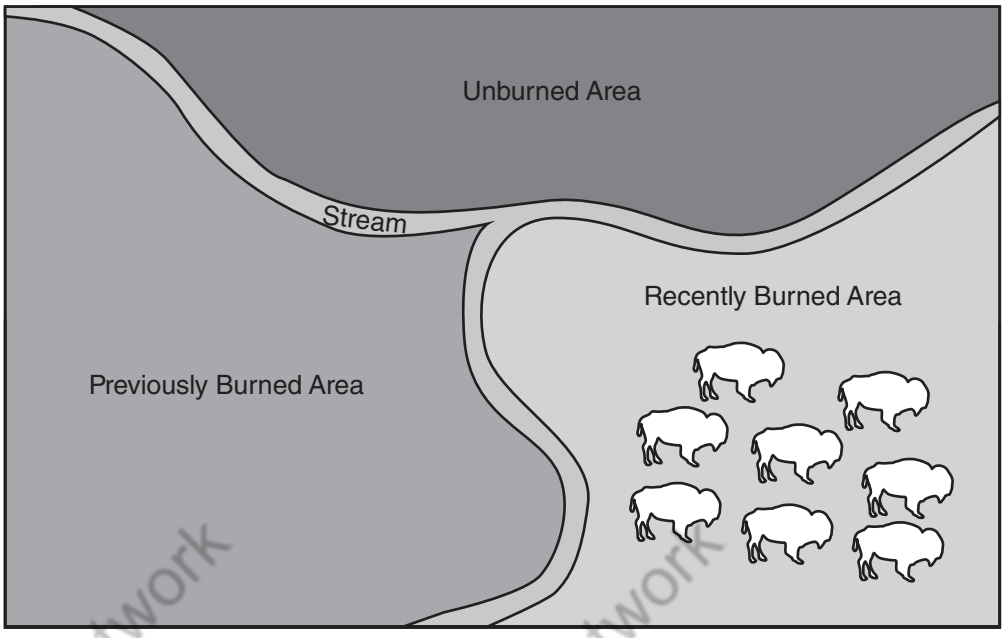
4 One common target of controlled burns at the preserve and the surrounding area is the invasive red cedar tree. A single red cedar tree can consume up to 40 gallons of water per day, taking this vital resource away from other plant life. These tall trees also cast shade that prevents sunlight from reaching the plants beneath them. The fast-growing red cedar trees tend to crowd out prairie grasses, the primary food source for wild and domestic animals that make the prairie their home. An imbalance in one component of the prairie's ecosystem affects the entire web of life. Controlled burns help maintain this ecosystem's delicate balance.

5 Of course, these controlled fires are intended to burn only a portion of an area. A total burn, which is a risk with an uncontrolled wildfire, would destroy all wildlife as well as the crops farmers plant for income. The key to using controlled fires is knowing which areas of land to burn and when. Conservation experts at the preserve employ the "patch-burn" approach, meaning they rotate which portion of land is burned each year. They study the land to find out which areas would most benefit from being burned, and then they arrange about a dozen burns over one-third of the land. This patch burning contains the fire within a specific area and allows animals in the burn area to safely relocate. The following year, conservationists will burn a different section of the preserve, while the land burned the previous year regrows healthier than before.

6 Researchers have tracked and studied the variety of plant species and animals that live on the preserve, and their studies show that the patch-burn approach has restored biodiversity to the area by promoting the growth of species that were at risk of being crowded out. The patch-burn system is so successful that the conservationists at the preserve provide training to prairie farmers about conducting controlled burns on their own land. Burning land to make it healthy may seem counterintuitive, but strategic controlled fires have helped the prairie sustain life for hundreds of years and, with careful management, will continue to do so.

OVERVIEW OF THE PATCH-BURN METHOD

By using a patch-burn method, conservationists and farmers can reduce the risk of unintentional fires and control where grazing animals, such as bison, roam.



The **unburned area** is overrun with weeds and has the greatest risk of catching fire.

The **previously burned area** is cleared of weeds, and young trees and crops grow freely and thrive.

The **recently burned area** has been cleared of all plants. Bison prefer to eat the fresh grass that will begin to grow in the recently burned area, and they will generally remain in that area until newer, fresher grass is available elsewhere.

START SHSAT PREP

26. According to the passage, how did fires started by natural causes prompt American Indians to begin practicing controlled burns?

E. by drawing animals in to the area to feed on the new growth sprouting from the burned land

F. by destroying tall trees and reducing the shade that had hindered the growth of planted crops

G. by burning off excess vegetation and increasing the availability of nutrients for the remaining plants

H. by causing changes to the bison's migration habits as bison herds fled from the wildfires on the prairie

27. Targeting red cedar trees in controlled burns affects the animals that live on the prairie mostly by

A. ensuring that the animals' main food source has the conditions needed for it to thrive.

B. endangering the animals that live near the trees scheduled for removal.

C. making sure that the water supply for the animals is sufficient.

D. reducing the animals' natural source of shade and protection from the elements.

28. Read this sentence from paragraph 6.

> **The patch-burn system is so successful that the conservationists at the preserve provide training to prairie farmers about conducting controlled burns on their own land.**

The author includes this sentence to show that

E. the conservationists are better qualified to lead preservation efforts than farmers are.

F. the conservationists are eager to involve others in the preservation of the prairie.

G. the conservationists' efforts will restore the original beauty and biodiversity of the region.

H. the conservationists' training program should serve as a model for other conservation organizations.

32. With which statement would the author most likely agree?

E. It is important to explain the purposes and the risks of controlled burns to the people living near a proposed burn area.

F. It is necessary to thoroughly examine a particular region in order to plan and execute a successful controlled burn.

G. Monitoring animals' reactions after a controlled burn on the prairie is a minor part of scientists' research.

H. Conservationists should consider the helpful aspects of invasive species before executing a controlled burn.

33. How do the diagram and its text provide additional support for the topic presented in the passage?

A. by depicting how the landscape in a given area changes as the patch-burn method is applied

B. by indicating that patch-burn fires are best suited for use in areas with certain features

C. by revealing that the patch-burn method is used primarily on uninhabited areas of land

D. by comparing the size of the area burned by the patch-burn method with that of unburned areas

START SHSAT PREP

If you have ever watched someone fall on the ice, you've seen slipperiness at work. But have you wondered what makes ice slippery, or why skates or skis glide across ice so easily? The answer might seem obvious: ice is smooth. Yet smoothness in itself does not explain slipperiness. Imagine, for example, skating on a smooth surface of glass or sheet metal.

Surprisingly, scientists do not fully understand why ice is slippery. Past explanations of slipperiness have focused on friction and pressure. According to the friction theory, a skate blade rubs across the ice, causing friction. The friction produces heat, melting the ice and creating a slippery, microscopically thin layer of water for the skate to glide on. The friction theory, however, cannot explain why ice is slippery even when [illegible] motionless [illegible] friction.

The pressure theory says that pressure from a skate blade [illegible] creating a slippery layer of water when the pressure is lifted. Science textbooks typically cite this explanation, but many scientists disagree, claiming that the pressure effect is not great enough to melt the ice. Nor can the pressure theory explain why someone wearing flat-bottomed shoes—which have a greater surface area than skate blades and thus exert less pressure per square inch—can glide across the ice or even go sprawling.

During the 1990s, another theory found acceptance: the thin top layer of ice is liquid, or "liquid-like," regardless of friction or pressure. This notion was first proposed more than 150 years ago by physicist Michael Faraday. Faraday's simple experiment illustrates this property: two ice cubes held against each other will fuse together. This happens, Faraday explained, because liquid on the cubes' surfaces froze solid when the surfaces made contact.

Faraday's hypothesis was overlooked, in part because scientists did not have the means to detect molecular structures. However, technological advances during recent decades allow scientists to measure the thin layer on the surface of the ice. For example, in 1996, a chemist at Lawrence Berkeley Laboratory shot electrons at an ice surface and recorded how they rebounded. The data suggested that the ice surface remained "liquid-like," even at temperatures far below freezing. Scientists speculate that water molecules on the ice surface are always in motion because there is nothing above them to hold them in place. The vibration creates a slippery layer of molecules. According to this interpretation of the Lawrence Berkeley Laboratory experiments, the molecules move only up and down; if they also moved [illegible] slippery [illegible] are skaters [illegible] vibrating molecules.

[illegible] slippery liquid-like [illegible] to ice, although ice is the most common example. Lead crystals and even diamond crystals, made of carbon, also show this property under certain temperature and pressure conditions.

45. Which of the following best tells what this passage is about?

A. why ice surfaces are liquid-like
B. how ice changes from a solid to a liquid
C. answers to the question of what makes ice slippery
D. the discoveries of Michael Faraday
E. the processes of freezing and melting

CONTINUE ON TO THE NEXT PAGE ▶

Cross-Purposes

What I am is *built*: concrete and steel.
I defy gravity. I am what every athlete
wants: to remain at the apex of the leap,
up in the air. And yet I am useful, too:
cars, trucks, people, even trains
make their way across my broad back.
Swallows and ospreys[1] nest in my trusses.

What I am is motion*. I am water, and I am older*
than anything else you know. No human
built me. I am gravity's best friend; I pool
and flow wherever gravity takes me.
I am the blood flowing in the runner's chest,
and I catch everything: from the hills,
the mountains. It all washes down through me.

What you are is an *accident*,
what happens to rain when rain gives in
to Earth's gravitational pull.
You are some tears dribbling from a mountain's
eye, running down the pavements
of small towns, into the cities, to the sea.
You are the path of least resistance.

What I am is power*. You, of course,*
have none: you are a static lump, an artifact
slowly decaying. But my regal flow
nourishes grasses, permits empires to rise.
Those who made you will break you,
in time, replacing you with yet another
clumsy structure. I have seen. I know.

"Clumsy"? Being rebuilt makes me
a friend of time, does it not? And it means
that I have siblings—those "clumsy" structures,
my sisters and brothers.
We stitch across the rip you make.
We are steel thread to the human needle.
We bind you up. We sew you.

And I sow into you*; in every cranny*
of your superstructure my vapors cling.
They bring out your softness, your rust.

[1]**ospreys:** large birds

Boast your best, and boast better yet.
I am listening to the bright hum
of the wind in your wires. Because I am,
above all else, patient. I will wait for you.

34. How does the similar construction of the sentence in line 1 and the sentence in line 8 contribute to the meaning of the poem?

E. It introduces the intended permanence of the structure and the ever-changing fluidity of the water.

F. It shows that the structure can bridge the gap caused by the water.

G. It suggests that the inflexible structure has more limitations than the adaptable water does.

H. It contrasts the stability of the structure with the instability of the water.

35. Read lines 2–4 and lines 12–14 from the poem.

I am what every athlete
wants: to remain at the apex of the leap,
up in the air.

I am the blood flowing in the runner's chest,
and I catch everything: from the hills,
the mountains.

How do the lines contribute to the development of a central idea of the poem?

A. They establish that both the structure and the water have endurance and control.

B. They highlight that both the structure and the water are powerful and impressive.

C. They suggest that the structure and the water are unaware of how similar they are.

D. They reveal that the structure and the water are surprised that they are interrelated.

36. The use of the words "siblings" and "my sisters and brothers" in lines 31–32 conveys the idea that the

E. forms water can take are less diverse than the types of structures that exist.

F. number of human-made structures is rapidly increasing.

G. water passes under many similar-looking structures as it flows.

H. structure is powerful because it is one of many.

37. The comparison to sewing in lines 33–35 helps show that the structure

A. enhances the beauty of the natural landscape.

B. brings people together more effectively than nature does.

C. provides clear boundaries for natural environments.

D. serves as a means for people to overcome an obstacle created by nature.

38. The last stanza (lines 36–42) conveys a central idea of the poem by

E. demonstrating that both the structure and the water depend on each other to fulfill their functions.

F. implying that a stronger structure would be able to resist the degradation caused by the water.

G. revealing that the passage of time will render both the structure and the water obsolete.

H. suggesting that the water will eventually weaken the structure and will continue to exist after the structure is gone.

39. Read lines 41–42 from the poem.

> ***Because I am,***
> ***above all else, patient. I will wait for you.***

Which of the following supports what is implied in these lines?

A. "*I am older / than anything else you know.*" (lines 8–9)

B. "*No human / built me.*" (lines 9–10)

C. "*It all washes down through me.*" (line 14)

D. "*Those who made you will break you,*" (line 26)

START SHSAT PREP

Zitkala-Sa (Gertrude Simmons Bonnin) was a Native American writer, musician, teacher, and political activist who was raised on the Yankton Sioux Reservation in South Dakota. In 1900 she published "Impressions of an Indian Childhood" (the term Indian *was commonly used at the time to refer to Native American people) to expose readers to what life is like on a reservation.*

Excerpt from "Impressions of an Indian Childhood"

by Zitkala-Sa

1 Soon after breakfast Mother sometimes began her beadwork. On a bright, clear day, she pulled out the wooden pegs that pinned the skirt of our wigwam[1] to the ground, and rolled the canvas part way up on its frame of slender poles. Then the cool morning breezes swept freely through our dwelling, now and then wafting the perfume of sweet grasses from newly burnt prairie.

2 Untying the long tasseled strings that bound a small brown buckskin[2] bag, my mother spread upon a mat beside her bunches of colored beads, just as an artist arranges the paints upon his palette. On a lapboard she smoothed out a double sheet of soft white buckskin; and drawing from a beaded case that hung on the left of her wide belt a long, narrow blade, she trimmed the buckskin into shape. Often she worked upon small moccasins for her small daughter. Then I became intensely interested in her designing. With a proud, beaming face, I watched her work. In [my] imagination, I saw myself walking in a new pair of snugly fitting moccasins. I felt the envious eyes of my playmates upon the pretty red beads decorating my feet.

3 Close beside my mother I sat on a rug, with a scrap of buckskin in one hand and an awl in the other. This was the beginning of my practical observation lessons in the art of beadwork. From a skein[3] of finely twisted threads of silvery sinews my mother pulled out a single one. With an awl she pierced the buckskin, and skillfully threaded it with the white sinew. Picking up the tiny beads one by one, she strung them with the point of her thread, always twisting it carefully after every stitch.

4 It took many trials before I learned how to knot my sinew thread on the point of my finger, as I saw her do. Then the next difficulty was in keeping my thread stiffly twisted, so that I could easily string my beads upon it. My mother required of me original designs for my lessons in beading. At first I frequently ensnared many a sunny hour into working a long design. Soon I learned from self-inflicted punishment to refrain from drawing complex patterns, for I had to finish whatever I began.

5 After some experience I usually drew easy and simple crosses and squares. These were some of the set forms. My original designs were not always symmetrical nor sufficiently characteristic, two faults with which my mother had little patience. The quietness of her oversight made me feel strongly responsible and dependent upon my own judgment. She treated me as a dignified little individual as long as I was on my good behavior; and how humiliated I was when some boldness of mine drew forth a rebuke from her!

---

[1]**wigwam:** hut with an arched framework of poles covered with bark, mats, or animal hides

[2]**buckskin:** leather made from the skin of a male deer

[3]**skein:** coiled length of yarn or other thread loosely wound on a reel

6 In the choice of colors she left me to my own taste. I was pleased with an outline of yellow upon a background of dark blue, or a combination of red and myrtle-green. There was another of red with a bluish-gray that was more conventionally used. When I became a little familiar with designing and the various pleasing combinations of color, a harder lesson was given me. It was the sewing on, instead of beads, some tinted porcupine quills, moistened and flattened between the nails of the thumb and forefinger. My mother cut off the prickly ends and burned them at once in the centre fire. These sharp points were poisonous, and worked into the flesh wherever they lodged. For this reason, my mother said, I should not do much alone in quills until I was as tall as my cousin Warca-Ziwin.

7 Always after these confining lessons I was wild with surplus spirits, and found joyous relief in running loose in the open again. Many a summer afternoon a party of four or five of my playmates roamed over the hills with me. We each carried a light sharpened rod about four feet long, with which we pried up certain sweet roots. When we had eaten all the choice roots we chanced upon, we shouldered our rods and strayed off into patches of a stalky plant under whose yellow blossoms we found little crystal drops of gum. Drop by drop we gathered this nature's rock-candy, until each of us could boast of a lump the size of a small bird's egg. Soon satiated with its woody flavor, we tossed away our gum, to return again to the sweet roots.

From "Impressions of an Indian Childhood" by Zitkala-Sa—Public Domain

A BRIEF HISTORY OF BEADWORK IN SOUTH DAKOTA

Date	Event
1500s	The Dakota use beads made from bones, shells, stones, and animal teeth. European traders bring glass beads to North America.
Late 1600s	The Dakota begin trading with the French in Minnesota.
1830s	The Dakota begin using glass beads in clothing, artwork, and decorations in place of Native-made beads.
1862–1865	The Dakota are expelled from their homelands in Minnesota as a result of the U.S.-Dakota War.
1900s–1920s	The Dakota create items to sell outside their community.

Source: MNopedia

42. In paragraph 1, the phrases "cool morning breezes swept freely" and "wafting the perfume of sweet grasses" affect the tone of the excerpt by suggesting

E. the sadness that the author feels reflecting upon her former way of life.

F. the enthusiasm with which the author approached her work indoors.

G. the fond feelings that the author has toward her childhood experiences.

H. the mix of emotions that the author feels toward her work and her mother.

43. The phrase "just as an artist arranges the paints upon his palette" in paragraph 2 suggests that

A. beadwork is a true form of art.

B. color is a source of artistic inspiration.

C. all artistic activities begin with a series of steps.

D. the beadworker tries to imitate art.

44. The author's use of sequence in paragraphs 1 and 2 contributes to the development of ideas in the excerpt by

E. listing the many steps that are involved in the process of beading in order to explain its difficulty and complexity.

F. conveying the importance of following the steps of the beading process in a precise order to work most efficiently.

G. emphasizing the time required to fully prepare for and execute the many large and small tasks in the activity of beading.

H. detailing each step in preparation for beading in order to highlight the author's enthusiasm for the work.

45. The details in paragraph 3 convey a central idea of the excerpt by suggesting that

A. the author was interested in the work because she knew her mother was making something for her.

B. the author had difficulty learning through observation but wanted to help her mother.

C. the author was determined to behave according to her mother's standards and sought her approval.

D. the author had great admiration for her mother's precision and mastery of her craft.

46. Which sentence best summarizes the process of beading that is described in the excerpt?

E. Take a buckskin bag full of beads and spread them out on a mat in different colors like a paint palette; take a double sheet of buckskin and smooth it out on a table; take a sinew and awl and thread the beads onto the buckskin in a desired pattern.

F. Cut the double sheet of buckskin into a shape; take a skein of sinew and pierce the buckskin with an awl; thread the sinew with beads of many different colors in a simple or complex pattern; twist the sinew to keep it tight after every stitch into the buckskin.

G. Arrange the beads into groups of colors on a mat; smooth out a double sheet of buckskin and cut it to shape; take a single thread of sinew; pierce the buckskin with an awl; thread the buckskin with the sinew and string it with beads, carefully twisting after every stitch.

H. Gather beads, buckskin, sinew, and awl and place them on a mat; cut the buckskin into the desired shape; decide on a pattern for the beads and create it using the sinews and the awl; thread the beads onto the sinew in the desired pattern and twist it tight.

47. The idea that mastering moccasin design and creation requires experience is best illustrated in the excerpt through

A. the information about the advanced technique of incorporating porcupine quills into a design.

B. the descriptions of the special materials that must be used to make decorated moccasins.

C. the descriptions of the various color combinations that make an attractive moccasin design.

D. the example of the author successfully and independently using a sharpened rod.

48. How does the author distinguish her point of view from that of her mother?

E. by describing their techniques for knotting sinew thread (paragraph 4)

F. by describing their approaches to beadwork design (paragraph 5)

G. by stating her mother's instructions on working with quills (paragraph 6)

H. by stating her mother's ideas about activities after lessons (paragraph 7)

START SHSAT PREP

Excerpt from "Niagara Falls"

by Rupert Brooke

1 The real secret of the beauty and terror of the Falls is not their height or width, but the feeling of colossal power and of unintelligible disaster caused by the plunge of that vast body of water. If that were taken away, there would be little visible change, but the heart would be gone.

2 The American Falls do not inspire this feeling in the same way as the Canadian. It is because they are less in volume, and because the water does not fall so much into one place. By comparison their beauty is almost delicate and fragile. They are extraordinarily level, one long curtain of lacework and woven foam. Seen from opposite, when the sun is on them, they are blindingly white, and the clouds of spray show dark against them. With both Falls the colour of the water is the ever-altering wonder. Greens and blues, purples and whites, melt into one another, fade, and come again, and change with the changing sun. Sometimes they are as richly diaphanous[1] as a precious stone, and glow from within with a deep, inexplicable light. Sometimes the white intricacies of dropping foam become opaque and creamy. And always there are the rainbows. If you come suddenly upon the Falls from above, a great double rainbow, very vivid, spanning the extent of spray from top to bottom, is the first thing you see. If you wander along the cliff opposite, a bow springs into being in the American Falls, accompanies you courteously on your walk, dwindles and dies as the mist ends, and awakens again as you reach the Canadian tumult. And the bold traveller who attempts the trip under the American Falls sees, when he dare open his eyes to anything, tiny baby rainbows, some four or five yards in span, leaping from rock to rock among the foam, and gambolling beside him, barely out of hand's reach, as he goes. One I saw in that place was a complete circle, such as I have never seen before, and so near that I could put my foot on it. It is a terrifying journey, beneath and behind the Falls. The senses are battered and bewildered by the thunder of the water and the assault of wind and spray; or rather, the sound is not of falling water, but merely of falling; a noise of unspecified ruin. So, if you are close behind the endless clamour, the sight cannot recognise liquid in the masses that hurl past. You are dimly and pitifully aware that sheets of light and darkness are falling in great curves in front of you. Dull omnipresent foam washes the face. Farther away, in the roar and hissing, clouds of spray seem literally to slide down some invisible plane of air.

3 Beyond the foot of the Falls the river is like a slipping floor of marble, green with veins of dirty white, made by the scum that was foam. It slides very quietly and slowly down for a mile or two, sullenly exhausted. Then it turns to a dull sage green, and hurries more swiftly, smooth and ominous. As the walls of the ravine close in, trouble stirs, and the waters boil and eddy. These are the lower rapids, a sight more terrifying than the Falls, because less intelligible. Close in its bands of rock the river surges tumultuously forward, writhing and leaping as if inspired by a demon. It is pressed by the straits into a visibly convex form. Great planes of water slide past. Sometimes it is thrown up into a pinnacle of foam higher than a house, or leaps with incredible speed from the crest of one vast wave to another, along the shining curve between, like the spring of a wild beast. Its motion continually suggests muscular action. The power manifest in these rapids moves one with a different sense of awe and terror from that of the Falls. Here the inhuman life and strength are spontaneous, active, almost resolute. . . . A place of fear.

---

[1] **diaphanous:** sheer, translucent

START SHAT PREP

4 One is drawn back, strangely, to a contemplation of the Falls, at every hour, and especially by night, when the cloud of spray becomes an immense visible ghost, straining and wavering high above the river, white and pathetic and translucent. The Victorian lies very close below the surface in every man. There one can sit and let great cloudy thoughts of destiny and the passage of empires drift through the mind; for such dreams are at home by Niagara. I could not get out of my mind the thought of a friend, who said that the rainbows over the Falls were like the arts and beauty and goodness, with regard to the stream of life—caused by it, thrown upon its spray, but unable to stay or direct or affect it, and ceasing when it ceased. In all comparisons that rise in the heart, the river, with its multitudinous waves and its single current, likens itself to a life, whether of an individual or of a community. A man's life is of many flashing moments, and yet one stream; a nation's flows through all its citizens, and yet is more than they. In such places, one is aware, with an almost insupportable and yet comforting certitude, that both men and nations are hurried onwards to their ruin or ending as inevitably as this dark flood. Some go down to it unreluctant, and meet it, like the river, not without nobility. And as incessant, as inevitable, and as unavailing as the spray that hangs over the Falls, is the white cloud of human crying. . . . With some such thoughts does the platitudinous[2] heart win from the confusion and thunder of a Niagara peace that the quietest plains or most stable hills can never give.

From LETTERS FROM AMERICA by Rupert Brooke—Public Domain

[2]**platitudinous:** clichéd, common

51. The central idea that the Falls communicate a feeling of "unintelligible disaster" (paragraph 1) is conveyed in paragraph 2 through a description of

A. the glow of the precious stones visible within the water.

B. the dynamic flow of the colors that are visible in the water.

C. the sudden appearance and disappearance of rainbows.

D. the sounds associated with a sense of falling.

52. Read this sentence from paragraph 2.

They are extraordinarily level, one long curtain of lacework and woven foam.

What is the effect of comparing the American Falls to a "long curtain of lacework and woven foam"?

E. It demonstrates the timelessness of the American Falls.

F. It conveys the secretive nature of the American Falls.

G. It illustrates the elegant uniformity of the American Falls.

H. It communicates the intense strength of the American Falls.

53. Read this sentence from paragraph 3.

> **These are the lower rapids, a sight more terrifying than the Falls, because less intelligible.**

Which statement best describes how the sentence fits into the overall structure of the excerpt?

A. It signals a change from the positive aspects of the Falls to the negative aspects.

B. It indicates a progression from the literal description of the water to a discussion of timeless truths.

C. It reinforces a shift from the qualities of the Falls to the qualities of the river.

D. It introduces a contrast between the obvious and the hidden features of the rapids.

54. Which sentence from the excerpt best supports the idea that the essence of the Falls lies in their emotional impact?

E. "If that were taken away, there would be little visible change, but the heart would be gone." (paragraph 1)

F. "By comparison their beauty is almost delicate and fragile." (paragraph 2)

G. "One is drawn back, strangely, to a contemplation of the Falls, at every hour, and especially by night, when the cloud of spray becomes an immense visible ghost, straining and wavering high above the river, white and pathetic and translucent." (paragraph 4)

H. "A man's life is of many flashing moments, and yet one stream; a nation's flows through all its citizens, and yet is more than they." (paragraph 4)

55. Read this sentence from paragraph 4.

> **There one can sit and let great cloudy thoughts of destiny and the passage of empires drift through the mind; for such dreams are at home by Niagara.**

The sentence most contributes to the development of ideas in the excerpt by

A. suggesting that viewing the Falls can be a life-changing experience.

B. showing that the cliffs of the Falls are a good place for self-examination.

C. emphasizing that the grandeur of the Falls seems impossible to grasp.

D. highlighting the type of reflection that is inspired by a visit to the Falls.

START SHSAT PREP

PART 2 — MATHEMATICS

57 QUESTIONS

IMPORTANT NOTES

(1) Formulas and definitions of mathematical terms and symbols are **not** provided.

(2) Diagrams other than graphs are **not** necessarily drawn to scale. Do not assume any relationship in a diagram unless it is specifically stated or can be determined from the information given.

(3) Assume that a diagram is in one plane unless the question specifically states that it is not.

(4) Graphs are drawn to scale. Unless stated otherwise, you can assume relationships according to appearance. For example, lines on a graph that appear to be parallel can be assumed to be parallel. This is also true for concurrent lines, straight lines, collinear points, right angles, etc.

(5) Reduce (simplify) all fractions to lowest terms.

CONTINUE TO THE NEXT PAGE ►

START SHSAT PREP

Grid-In Questions

Questions 58–62

DIRECTIONS: Solve each problem. On the answer sheet, write your answer in the boxes at the top of the grid. Start on the left side of each grid. Print only one number or symbol in each box. Under each box, fill in the circle that matches the number or symbol you wrote above.

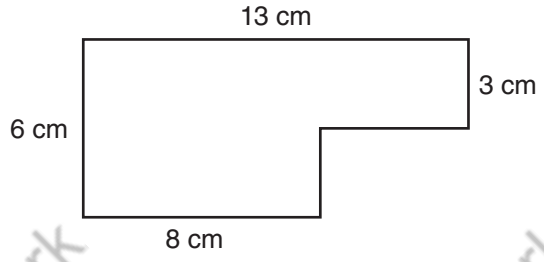
- **Do not fill in a circle under an unused box.**
- **Do not leave a box blank in the middle of an answer.**

58. $\frac{3}{5}(2x + 5) - 2x$

After the expression above is simplified, what is the coefficient of x expressed as a decimal?

59. Two number cubes have sides labeled 1 through 6. Both number cubes are rolled. How many different outcomes will have a sum of 6?

60.



The figure above shows a scale drawing of a garden, where 1 centimeter represents 2.5 meters. What is the perimeter of the actual garden in meters?

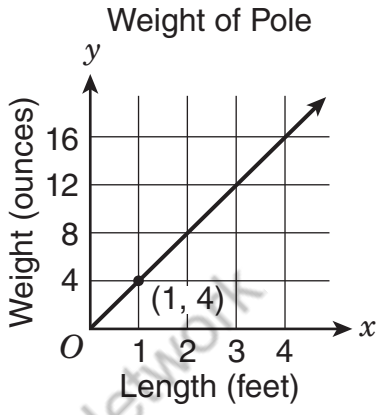
START SHSAT PREP

MULTIPLE CHOICE QUESTIONS

QUESTIONS 63–114

DIRECTIONS: Solve each problem. Select the best answer from the choices given. Mark the letter of your answer on the answer sheet. When you are solving problems, you can write in the test booklet or on the scrap paper given to you.

63. This graph shows y, the weight of a pole of length x.



What is represented by the point with coordinates (1, 4)?

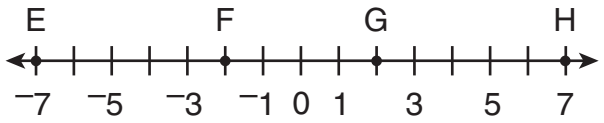
A. The unit rate is 4 ounces per foot.

B. The y-intercept is 4.

C. A pole 4 feet long weighs 1 ounce.

D. The length increases 4 feet for each 1 ounce of weight.

64. The number line shows points E, F, G, and H.



Which point represents the sum of $2.5 + (-4.5)$?

E. point E

F. point F

G. point G

H. point H

65. If $\frac{9}{2x} = \frac{3y}{8}$, where $x \neq 0$ and $y \neq 0$, what is the product of x and y?

A. 4

B. 6

C. 12

D. 16

START SHSAT PREP

66. A car dealership is having a sale where all cars have a 12% discount. What is the discounted price of a car that originally cost $15,600?

E. $13,728
F. $14,300
G. $14,400
H. $15,588

67. $4\frac{2}{3} \div 2\frac{1}{2} =$

A. $\frac{15}{28}$
B. $1\frac{13}{15}$
C. $2\frac{1}{3}$
D. $3\frac{1}{3}$

68. In a sports league each team has 36 players and 3 coaches. There are also a number of team assistants. The ratio of team assistants to players is $\frac{1}{6}$. What is the ratio of coaches to assistants?

E. $\frac{1}{4}$
F. $\frac{1}{2}$
G. $\frac{2}{3}$
H. $\frac{5}{6}$

69. Lena is building a fence. She will need to dig holes to help support the posts that hold up the fence. The holes need to have a depth of $3\frac{1}{3}$ feet below the ground. Each post is 10 feet long. What is the height of the part of the post that is above the ground?

A. $6\frac{2}{3}$ feet
B. $7\frac{1}{3}$ feet
C. 10 feet
D. $13\frac{1}{3}$ feet

START SHSAT PREP

70. $p + 2r = r(p + 1) + 1$

In the equation above, if $r = 2$, what is the value of p?

E. 0
F. 1
G. 2
H. 3

71. Karen reads at the rate of 60 pages per day. Martina reads 25 percent more pages per day than Karen. If the two students begin 1,500-page reading assignments on the same day, how many days sooner will Martina complete the assignment than Karen?

A. 4
B. 5
C. 7
D. 15

72. Claire is running on a circular track. She has already run 650 meters. Each lap around the track is a distance of 120 meters. Her goal is to run at least 2,500 meters in all. How many more laps does she need to complete in order to reach her goal?

E. 5
F. 6
G. 15
H. 16

73. A company with 200 employees grew in size by 25% between 2005 and 2010. The company grew again by 10% between 2010 and 2015. What was the total number of employees in 2015?

A. 235
B. 260
C. 270
D. 275

START SHSAT PREP

74. A bowl contains 12 green candies, 4 yellow candies, and some red candies. The probability of choosing a green candy at random is twice as great as the probability of choosing a red candy at random. What is the probability of choosing a yellow candy at random?

E. $\frac{2}{11}$

F. $\frac{2}{9}$

G. $\frac{1}{4}$

H. $\frac{3}{11}$

75. A seller at an Internet site reports that 99.7% of his sales have resulted in satisfied customers. Based on the report, what fraction of the sales have resulted in unsatisfied customers?

A. $\frac{1}{997}$

B. $\frac{3}{1{,}000}$

C. $\frac{3}{997}$

D. $\frac{1}{300}$

76. Serena was studying the number of water stations for different lengths of races. The table below shows the data she collected.

WATER STATIONS IN RACES

Length of Race (mi)	Number of Water Stations
3	2
12	8
18	12

Which equation represents the relationship between the length of the race, x miles, and the number of water stations, y?

E. $y = \frac{2}{3}x$

F. $y = \frac{3}{2}x$

G. $y = x + 6$

H. $y = x - 1$

START SHSAT PREP

81. What is the value of $\dfrac{\left(1\frac{5}{7}-1\frac{6}{7}\right)}{\left(3\frac{4}{7}-3\frac{6}{7}\right)}$?

A. $-\frac{1}{2}$

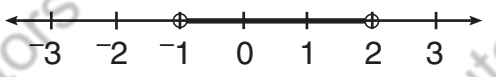
B. $-\frac{1}{7}$

C. $\frac{1}{7}$

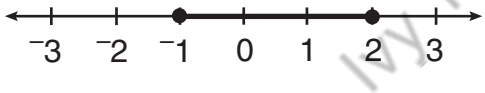
D. $\frac{1}{2}$

82. Which number line represents the values of x that satisfy the inequality $-5 \le 1 - 3x \le 4$?

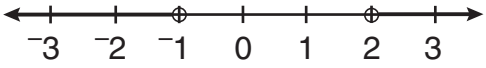
E.



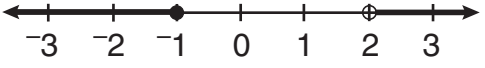
F.



G.



H.



83. If 1 sind = 0.75 plunks, how many sinds are equivalent to 8 plunks, rounded to the nearest hundredth?

A. 1.33

B. 6.00

C. 7.25

D. 10.67

84. Simplify:

$$8x - (7 + 2.5x) + 2$$

E. $5.5x - 9$

F. $5.5x - 5$

G. $10.5x - 9$

H. $10.5x - 5$

85. Kim can repair 3 bicycles every 4 hours. At this rate, how long will it take her to repair 5 bicycles?

A. 6 hr

B. 6 hr 40 min

C. 6 hr 45 min

D. 7 hr 15 min

START SHSAT PREP

86. Jar Q contains 12 balls, and Jar R contains 8 balls. The probability of drawing a yellow ball at random from Jar Q is $\frac{1}{3}$. The probability of drawing a yellow ball at random from Jar R is $\frac{3}{4}$. All the balls are poured into an empty jar, Jar S. What is the probability of drawing a yellow ball at random from Jar S?

E. $\frac{1}{4}$

F. $\frac{1}{3}$

G. $\frac{1}{2}$

H. $\frac{4}{7}$

87.

GIA'S BAG OF SNACK MIX

Snack	Number in Bag
Pretzels	12
Raisins	9

Gia and her friends counted the numbers of pretzels and raisins in their bags of snack mix. The table above shows the numbers in Gia's bag. Which other snack mix bag has a ratio of pretzels to raisins in the same proportional relationship as Gia's bag?

A. ADELE'S BAG OF SNACK MIX

Snack	Number in Bag
Pretzels	6
Raisins	18

B. CARL'S BAG OF SNACK MIX

Snack	Number in Bag
Pretzels	15
Raisins	12

C. ISABEL'S BAG OF SNACK MIX

Snack	Number in Bag
Pretzels	18
Raisins	15

D. TREVON'S BAG OF SNACK MIX

Snack	Number in Bag
Pretzels	16
Raisins	12

88. If $y = 4x$, what is the value of $3y + 2(3y + 5) - x$ in terms of x?

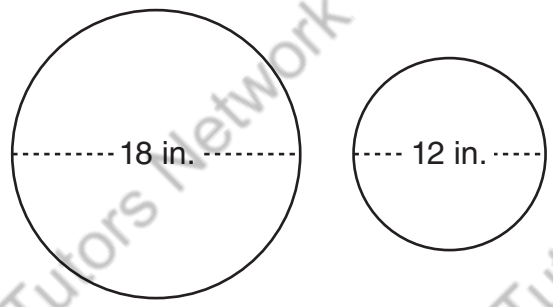
E. $8x + 10$

F. $32x + 10$

G. $35x + 10$

H. $36x + 10$

89. Two circular plates have the dimensions shown.



What is the difference between the areas of the two plates, in square inches?

A. 6π

B. 9π

C. 45π

D. 180π

90. If $x = -4$, what is the sum of x and 10% of $|x|$?

E. -4.4

F. -3.6

G. 0.4

H. 4.4

91. The volume of a cube is 512 cubic centimeters. What is the length, in centimeters, of **one** side of this cube?

A. 8

B. $42\frac{2}{3}$

C. $85\frac{1}{3}$

D. 128

START SHSAT PREP

92. The high temperature on Monday was $x°$ F. On Tuesday, the high temperature was 84° F, which was a 5% increase from Monday's high temperature. On Wednesday, the high temperature was 10% lower than it was on Monday. How much lower was the high temperature on Wednesday than the high temperature on Monday?

E. 4.0° F
F. 8.0° F
G. 8.4° F
H. 8.8° F

93. The integers $(n-1)$, n, and $(n+1)$ are factors of 168. What is the **greatest** possible value of n?

A. 3
B. 7
C. 14
D. 84

94. Raoul gave two musical performances. His second performance occurred 86 days after his first performance. If Raoul's second performance was on a Tuesday, on what day of the week was his first performance?

E. Sunday
F. Monday
G. Wednesday
H. Thursday

95. Michael received a check for $213 for working 20 hours at his part-time job. The amount on the check was his total pay after $32 in taxes was deducted. What was Michael's hourly pay rate before taxes were deducted?

A. $9.05
B. $10.65
C. $12.25
D. $21.35

START SHSAT PREP

100. A community garden had 50 members in 2001. In each of the next three years, the number of members increased by 40% over the number of members from the previous year. How many members were there in 2004? (Round to the nearest whole number.)

E. 70

F. 98

G. 110

H. 137

101. Which inequality is equivalent to $6x - 20 < 5x - 2(5 - 3x)$?

A. $x < 16$

B. $x < \frac{5}{2}$

C. $x < -2$

D. $x > -2$

102. A box contains a total of 30 paper clips with colors in the ratio red:white:blue = 2:5:3. Suppose that one paper clip of each color is removed from the box and not replaced. What is the probability that the next paper clip chosen will be blue?

E. $\frac{5}{27}$

F. $\frac{2}{7}$

G. $\frac{8}{27}$

H. $\frac{3}{10}$

103. The least positive integer evenly divisible by the first 6 positive integers is 60. What is the least positive integer evenly divisible by the first 8 positive integers?

A. 1,680

B. 840

C. 480

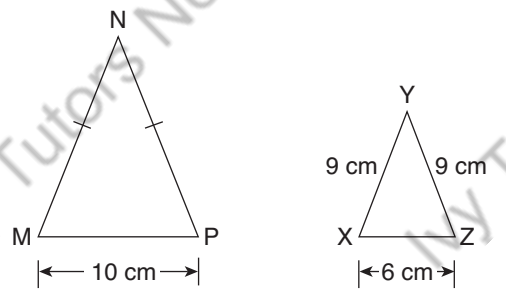
D. 420

START SHSAT PREP

104. Three different colors of paint are available to paint the window frame, the door, and the wall of a house. If no two parts of the house may be painted the same color, how many different ways are there to paint the three parts of the house?

E. 3
F. 6
G. 9
H. 27

105.



Triangle MNP is similar to triangle XYZ, and MN = NP. What is the perimeter of triangle MNP?

A. 25 cm
B. 30 cm
C. 36 cm
D. 40 cm

106. Suppose that w, x, y, and z are integers, none of which are zero. Under which set of conditions would the product $x^2yz^3|w|$ **always** be positive?

E. x is positive and w is positive.
F. x is negative and w is negative.
G. y is negative and z is negative.
H. x and y are negative, and z and w are positive.

107. Chris has 1 red shirt, 2 white shirts, and 3 black shirts. Chris picks a shirt at random. Without putting the first shirt back, he picks a second shirt at random. What is the probability that the first shirt is black and the second shirt is red?

A. $\frac{1}{12}$
B. $\frac{1}{10}$
C. $\frac{1}{5}$
D. $\frac{7}{10}$

START SHSAT PREP

108. Rita used 125 small solid cubes to build a large solid cube. The measure of each edge of the small cubes equals 1 inch. What is the measure of each edge of the large cube, in inches?

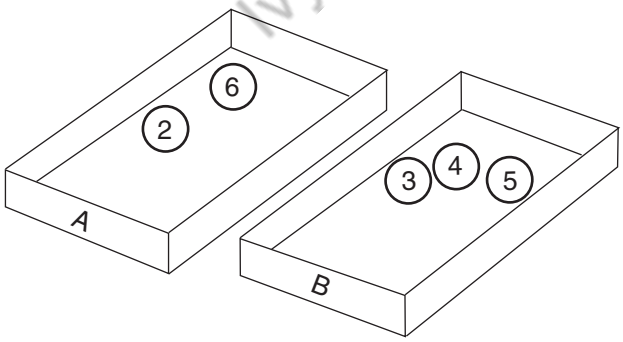
E. 5

F. 25

G. 41.33

H. 125

109.



Five numbered balls are placed in two boxes as shown in the figure above. Davina picks one ball at random from Box B and places it in Box A. Then Yusuf picks one ball from Box A without looking. What is the probability that Yusuf will pick a ball with an odd number?

A. $\frac{2}{9}$

B. $\frac{1}{3}$

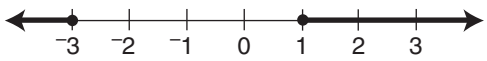
C. $\frac{2}{5}$

D. $\frac{2}{3}$

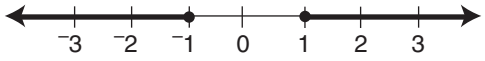
START SHSAT PREP

110. Which graph represents the solution to $|x + 1| \geq 2$?

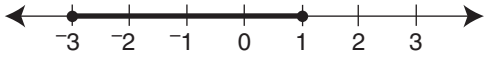
E.



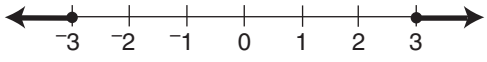
F.



G.



H.



111. A rectangular kitchen floor is 12 feet long and 7.5 feet wide. It will be covered completely with new square tiles measuring 0.75 foot on each side. How many tiles will cover the floor?

A. 68
B. 78
C. 120
D. 160

112. Typically, an amusement park sells 3 times as many tickets on Sunday as on any weekday, and 4 times as many tickets on Saturday as on Sunday. If the number of tickets sold on Saturday and Sunday totaled 30,000, how many tickets are expected to be sold on the following Monday?

E. 2,000
F. 2,500
G. 3,000
H. 4,285

START SHSAT PREP