The New York City Department of Education

2022

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

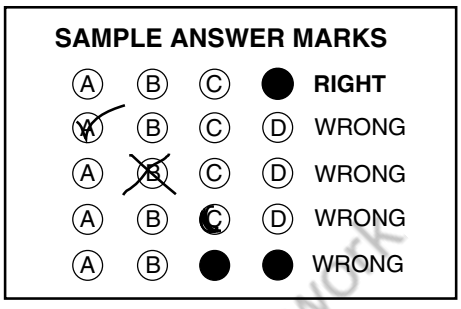
Grid 9: In most cases, Grid 9 is already filled in for you. If it is not, copy the letter and numbers shown in the upper-right corner of your test booklet into the boxes. Below each box, fill in the circle containing the same letter or number as the box.

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.

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Pearson

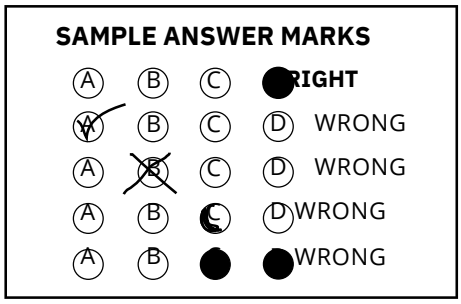
A

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

GENERAL DIRECTIONS, continued

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.



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START SHSAT PREP

A

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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 edit should be made to correct this sentence?

> In 1962 the agile athletic Wilt Chamberlain became the first and only professional basketball player in the United States to score 100 points in a single game.

A. **Insert** a comma after ***agile***.

B. **Insert** a comma after ***first***.

C. **Insert** a comma after ***only***.

D. **Insert** a comma after ***States***.

2. Read this sentence.

> The engineers tried some other things in the hope of finding a more effective insulation for the compartment.

What is the most precise revision for the words ***The engineers tried some other things***?

E. **The** engineers did experiments with several new materials

F. **The** engineers tested foam and fiberglass

G. **The** engineers examined two new materials

H. The engineers worked with foam and fiberglass

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.

Cracking the Code

(1) Computer code is part of every electronic interaction, from video games to home thermostats to vehicle GPS systems. (2) Code is a language that computers can interpret, and programmers use it to instruct computers to perform different tasks, such as finding, sorting, or calculating data.
(3) People who code have to learn this language. (4) They can construct programs that will perform detailed tasks. (5) The programs can also perform complex tasks.

(6) A coding language uses letters, numbers, and symbols that are arranged in a way that makes sense to a computer. (7) The code that makes up a program tells a computer how to process information. (8) Studying a coding language involves learning the rules for combining phrases and instructions so that they are recognizable to the computer. (9) Once a person understands coding rules, the possibilities for applying them are infinite.

(10) Coding skills are becoming important in many occupational fields. (11) For example, code can be used to create programs to track, analyze, and predict changes in the stock market. (12) Code can also be designed to help doctors track and monitor a patient's health. (13) Jobs that require coding skills are typically higher paying, offering salaries that are up to as much as $22,000 a year more than jobs that do not require coding knowledge.

(14) People have a variety of opportunities to learn how to code. (15) In some schools, young people can study computer science and coding just as they study foreign languages. (16) Computer science teachers can use websites and apps that employ games designed to help everyone understand how code works. (17) Even high school students who do not take computer science can learn coding by attending coding workshops and online classes or by watching tutorials online.
(18) After studying the basics of coding, some students may become interested in learning how to create programs, such as games and apps.

(19) The late Steve Jobs, a pioneer in computer technology, once said, "Everybody in this country should learn how to program a computer . . .because it teaches you how to think." (20) Learning to code can seem challenging, but one does not need to become an expert programmer to reap the benefits of understanding this language.

START SHSAT PREP

5. What is the best way to combine sentences 3 through 5 to clarify the relationship between ideas?

A. People who code have to learn this language because they can construct programs that will perform detailed and complex tasks.
B. People who code have to learn this language so they can construct programs that will perform detailed or complex tasks.
C. When people who code have to learn this language, it is so they can construct programs that will perform detailed and complex tasks.
D. If people who code have to learn this language, then they can construct programs that will perform detailed as well as complex tasks.

6. Which sentence should follow sentence 5 to best state the main claim in the passage?

E. People should take advantage of opportunities to study and learn basic coding because of its many valuable benefits.
F. People should attempt to understand how code can be used to design programs that are beneficial for a variety of industries and businesses.
G. Schools should offer coding classes because knowing how to code will help students succeed in many types of businesses.
H. Students should prepare for the future job market by studying code and learning how to code programs.

7. Which revision of sentence 10provides the best transition to the argument in the third paragraph (sentences 10–13)?

A. Learning a coding language may be difficult, but coding skills are becoming important in many occupational fields.
B. Learning a coding language is useful because coding skills are becoming important in many occupational fields.
C. Employers in most industries realize that people with coding skills can demand higher salaries in many occupational fields.
D. Even though programming is its own unique field, coding skills are becoming important in many occupational fields.

START SHSAT PREP

8. Which sentence would best follow sentence 13 and support the ideas in the third paragraph (sentences 10–13)?

E. Experienced programmers, software engineers, and system administrators at large companies can earn well over $100,000 a year.
F. Hospitals, physicians' offices, and pharmaceutical companies are frequently looking to hire people who code to help with a variety of tasks.
G. Many companies are eager to hire employees who have experience in a specific industry as well as knowledge of basic coding.
H. According to a report from a job market analytics firm, almost half of today's jobs paying more than $58,000 a year call for some level of coding ability.

9. Which concluding sentence would best follow sentence 20 and support the argument presented in the passage?

A. People should understand that knowing how to code is becoming an essential requirement for most high-paying jobs.
B. By understanding basic coding concepts, people can participate in an increasingly digital job market.
C. Students who want to secure a high-paying job in the technology industry should become proficient in coding.
D. Since coding is a valuable marketplace skill, today's students should begin to write their own computer programs.

START SHSAT PREP

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 c

The Best Laid Plans of Ravens

1 In Edgar Allan Poe's poem "The Raven," a raven visits a lonely man's home and responds to the man's pleading questions with only the word "nevermore." The poem's narrator interprets the word as a prediction of doom for his future. A talking, prophetic raven may seem to be the wild imaginings of the poet, but a new study published in the journal *Science* hints that one particular idea behind the poem might not be as far-fetched as it seems. For most of human history, people assumed that animals do not understand the passage of time in the same way people do. Some people believed that animals might remember events from the past and that instinct might drive them to make preparations in order to guarantee survival, but most people did not think that animals had the ability to plan. At Lund University in Sweden, researchers argue that ravens may be able to think ahead and even plan for the future.

2 It can be difficult to test an animal's ability to plan because human observers must be certain they are not mistaking instinctual behavior for intentional planning. For example, many animals hoard food so that they will not run out later, but scientists who study animals would not call hoarding a decision to plan for the future. This action is merely instinctual. Cognitive scientists argue that in order for an animal's behavior to qualify as preparing for the future, the animal must use specific decision-making skills to solve a problem.

3 To avoid mistaking instinctual behavior for evidence of decision-making, the Lund University researchers designed two experiments to test ravens' ability to plan. Ravens belong to the corvid family, a group of birds known for their intelligence. A study in 2007 showed that corvids have the tendency to save only certain types of food, which suggests that they are planning for the future rather than acting on instinct. In order to investigate that theory, the researchers had to design experiments that would achieve results that could not be explained by an instinctual behavior of food hoarding. Therefore, the ravens were taught two behaviors that they do not normally perform in the wild.

4 For the first experiment, the researchers showed the birds how to use a small stone to open a box and get treats. Once the ravens learned the behavior, the researchers presented the birds with four stones. Only one stone was the right size to open the box. The birds learned to select that stone and set it aside until the researchers presented the box. The second experiment involved bartering. A researcher would trade the ravens a large treat for a bottle cap. Later, the researchers presented the ravens with a group of items, including small treats and the bottle cap. The ravens chose the bottle cap over the treats and waited for the original researcher to trade with them again so that they could get more treats. In both experiments, the ravens waited patiently for up to seventeen hours for the researcher to return.

5 The results of these experiments are exciting, but more evidence needs to be gathered before scientists can fully conclude that ravens can plan for the future. Some scientists argue that the ravens might be choosing the stone and bottle cap because the ravens have been trained to do so, not necessarily because the ravens are thinking ahead. Regardless, like other recent advances in animal science, these experiments show that ravens could be much smarter than first believed, and scientists now believe that ravens do actually think about their own future.

START SHSAT PREP

10. How does paragraph 1 introduce the ideas that ravens may perceive time and plan for the future?

E. It mentions a poem that considers whether a raven can see the future and then discusses why people have traditionally doubted that ravens have the ability to plan.
F. It references a poem about a raven that seems to have insight into the future and then mentions new information that suggests ravens have the ability to plan.
G. It mentions a poem that led people to believe that ravens are aware of the future and then explains that this belief prompted scientists to study ravens' ability to plan.
H. It references a poem about a raven that predicts the future and then describes the importance of differentiating ravens' instincts from their ability to plan.

11. Read this sentence from paragraph 1.

At Lund University in Sweden, researchers argue that ravens may be able to think ahead and even plan for the future.

Which sentence from paragraph 4 provides support for this argument?

A. "Once the ravens learned the behavior, the researchers presented the birds with four stones."
B. "A researcher would trade the ravens a large treat for a bottle cap."
C. "Later, the researchers presented the ravens with a group of items, including small treats and the bottle cap."
D. "The ravens chose the bottle cap over the treats and waited for the original researcher to trade with them again so that they could get more treats."

12. Read these sentences from paragraph 2.

For example, many animals hoard food so that they will not run out later, but scientists who study animals would not call hoarding a decision to plan for the future. This action is merely instinctual.

Which statement describes the effect of the phrase "merely instinctual" in the passage?

E. It implies that animals are skilled at finding and saving food for later consumption.
F. It conveys that many animals will usually prioritize gathering food over other activities.
G. It suggests that animals often store more food than they will be able to consume.
H. It emphasizes that many animals collect food automatically rather than with true intention.

START SHSAT PREP

13. In the first experiment described in paragraph 4, which of the ravens' behaviors provides the strongest evidence for the claim that the birds are capable of planning?

A. They accepted treats from the box.

B. They set aside the stone that would open the box.

C. They learned which stone could open the box.

D. They waited for researchers to bring the box.

14. Read this sentence from paragraph 4.

In both experiments, the ravens waited patiently for up to seventeen hours for the researcher to return.

How does this sentence fit into the overall structure of the passage and contribute to the development of ideas?

E. It concludes the description of the experiments, supporting the idea that ravens can make decisions for the future.

F. It establishes the timeline required in experiments designed to determine learned behaviors in ravens.

G. It reveals how the ravens solved the problems posed in the experiments, proving that ravens have the ability to plan ahead.

H. It indicates that hoarding food is both an instinctual and a learned behavior among ravens.

15. How does paragraph 5 fit into the overall structure of the passage and contribute to the development of ideas?

A. It introduces a problem with the results of the study at Lund University, suggesting that some scientists believe that further research will not lead to a clear answer.

B. It summarizes the final steps of the study at Lund University, emphasizing the difficulties researchers had in differentiating between true planning and practiced actions.

C. It provides a conclusion to the information about the Lund University study, indicating that some scientists think further research is needed in order to prove the idea.

D. It lists the effects of the study at Lund University, implying that researchers should have designed experiments that better differentiated between planning and instinct.

Ellen, the narrator, is preparing to leave her parents and the family farm for college the next day.

Excerpt from *Winter Wheat*

by Mildred Walker

1 I love Dad's way of talking that makes him seem different from other ranchers. He's lived here twenty-three years, but he still says "back East where I come from." He's the one who gets excited when I do about spring coming or a serial [1] running in the magazine we're both reading, but it's what Mom says that I depend on. When Mom used to say "Don't worry" about my pet chicken or dog or new calf, it always got well. Dad is always talking of going some place, not now, but next year, maybe. Mom seems to think of nothing farther away than today or perhaps yesterday or tomorrow morning.

2 Mom folded the ironing board and put it inside their bedroom that was just off the kitchen. She carried in the freshly ironed clothes. Dad went back to his paper. When Mom came back she took beans from the cupboard to soak for tomorrow. Dad always said Mom could make all the dishes he'd had back in Vermont as well as though she were a New Englander herself, instead of a Russian. All of a sudden, I realized that tomorrow when those beans would be ready to eat I'd be going away. It gave me a funny feeling.

3 "I'll be taking the train tomorrow night," I said aloud, more to hear it myself.

4 "We can drive you into town in the afternoon," Dad said, dropping his paper on the floor.

5 "There's no need to go to town; she can catch the train at Gotham just as well. We haven't nothing to take us into town for," Mom said.

6 "Well, we don't have to decide tonight," Dad said, but I knew he wanted to go into Clark City. It wouldn't be so flat as just seeing me go off on the train from Gotham. My going away was hard on both of them; they were so different—and I was part of them both. It made me uncomfortable to think of leaving them.

7 While I was getting ready for bed in my room that's off the front room, I saw how it would be if I left from town. We'd go in right after dinner and go around to the stores, Dad going one way and Mom and I another. Dad would probably have his hair cut at the barbershop and stop in the bank and meet someone he knew to talk to. Then we'd meet at the big store on the corner and go to the cafeteria for supper. The train stops ten minutes or so at the station in town and there are other people and excitement and you have time to wave from the platform and then again from your window by your seat. We went to the station in Clark City to see the Goodals off when they went back to Iowa.

8 If I left from Gotham, we'd just drive down in the truck and wait till the train came. It only stops long enough for you to get on and you hardly have time to taste the flavor of going away.

START SHSAT PREP

[1] **serial:** story published in short segments at regular intervals

9 I sat on the bed in my pyjamas with my arms around my knees. I couldn't keep from thinking of that time Dad went back East. I tried to, and then I just sat still and looked straight at it. Sometimes that's better than working so hard to keep from looking at what's in your mind.

10 Dad went all the way back to Vermont. . . .It was in November and it was already dark when the train came through Gotham. Even now, I could feel how cold and dark it was. I held Mom's hand. Dad was so dressed-up he seemed strange. . . .We stood there without saying anything until Dad told Mom to remember to call Mr. Bardich, our neighbor, if the cow didn't calve tomorrow.

11 "I'll manage," Mom snapped back.

12 "I wish you could go, Anna," Dad said to Mom, "and we could take Ellen." . . .

13 "Good-by, Anna Petrovna," he said, looking at Mom. I had never heard him call her by two names before.

14 "Good-by," Mom said, standing still, without smiling.

15 Then he was gone and the crossroads were darker than ever. The train light shone on the high window in the top of the grain elevator for a moment and then that too was dark. We got into our old Ford and Mom drove back to the house. My throat ached all the way. The name Dad had called Mom kept saying itself in my ears: "Anna Petrovna, Anna Petrovna." . . .

16 Our house seemed lonely when we came back to it. It seemed to be hiding under the coulee.[2] I went with Mom to put the truck in the barn that was bigger than the house. I think Mom was prouder of our barn than the house, anyway. We walked back to look at the cow that was going to calve. She was just a big light blob in the dark, waiting. I had thought she was exciting this morning, but now she seemed sad, too.

17 The wind blew when we walked across the open space to the house and I couldn't help shivering with the cold. Inside the house it was warm, but empty.

18 "Bring your nightgown in here and I heat you some milk," Mom said.

19 I drank the milk sitting on a stool in front of the stove. It tasted good, but the lonely ache in my throat was still there. I picked up my clothes and hung them neatly behind the stove and put my cup on the sink board. Mom was fixing oatmeal for tomorrow morning.

20 "Good night, Mom," I said almost timidly, standing beside her. She seemed wrapped around in a kind of strangeness. Then she turned around and drew me to her. The front of her dress was warm from the stove. I felt the comfortable heat through my gown. She laid her hand against my face and it felt rough and hard but firm. I dared ask her something I wanted to know.

21 "Mom, was that really your name—what Dad called you?"

22 Her voice sounded surprised. "Why, Yeléna, you know that; Anna Petrovna. You know I am born in Russia, in Seletskoe."

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2 **coulee:** small gulch or ravine

START SHSAT PREP

23 “Yes, but I didn’t know your other name,” I said.

24 “Anna Petrovna Webb.” She pronounced it slowly. “Once I think what a funny name Ben Webb is!” She laughed. Her laugh was warm and low like our kitchen, and comfortable. The house seemed natural and right again. . . .

25 But now that I am grown, I feel the wall of strangeness between them, more than when I was a child. I wondered how they would get along without me.

18. Read these sentences from paragraph 2.

Dad always said Mom could make all the dishes he’d had back in Vermont as well as though she were a New Englander herself, instead of a Russian. All of a sudden, I realized that tomorrow when those beans would be ready to eat I’d be going away. It gave me a funny feeling.

The sentences help develop a theme of the excerpt by

E. suggesting that life presents people with many challenges.

F. implying that the stress of major life events can cause confusion.

G. demonstrating that moving on from the familiar is a common human experience.

H. emphasizing the idea that people can easily learn the routines of being part of a new culture.

19. Read this sentence from paragraph 3.

“I’ll be taking the train tomorrow night,” I said aloud, more to hear it myself.

This remark contributes to the conflict in the excerpt by

A. revealing Dad’s reasons for wanting to drive to the city.

B. causing tension between Mom and Dad.

C. leading Ellen to distance herself from both Mom and Dad.

D. showing Mom’s reluctance to plan that far in advance.

START SHSAT PREP

20. Read this sentence from paragraph 9.

I tried to, and then I just sat still and looked straight at it.

How does the phrase "looked straight at it" contribute to the meaning of the excerpt?

E. It shows that Ellen is willing to deal with a problem directly instead of ignoring it.
F. It suggests that Ellen studies all parts of an issue and not just its surface.
G. It illustrates that Ellen examines both sides of an argument.
H. It implies that Ellen is eager to seek wisdom from past experiences.

21. The words "cold" and "dark" affect the tone in paragraph 10 by

A. highlighting the feeling of unpredictability among the family members.
B. showing the feelings of anger and resentment Ellen directs toward her parents.
C. exaggerating the feeling of regret Dad experiences when leaving his family.
D. emphasizing the feelings of separation and loss that Ellen feels.

22. Which sentence from the excerpt provides evidence that Ellen has a lot in common with her father?

E. "He's the one who gets excited when I do about spring coming or a serial running in the magazine we're both reading. . . ."(paragraph 1)
F. " 'We can drive you into town in the afternoon,' Dad said, dropping his paper on the floor." (paragraph 4)
G. " 'Well, we don't have to decide tonight,' Dad said, but I knew he wanted to go into Clark City." (paragraph 6)
H. "I wondered how they would get along without me." (paragraph 25)

Ruins of a Fabled City

1 The African country of Zimbabwe took its name from the Shona word meaning "stone enclosures" or "venerated houses." In fact, today dozens of stone ruins are scattered throughout Zimbabwe and other areas in southeastern Africa. One of these ruins, known as Great Zimbabwe, was once a fabled city
that inspired tales that circulated throughout Europe. Where was this remarkable city, and who had built it? For centuries the mystery occupied the minds of explorers and treasure seekers.

2 The first reports to Europeans of Great Zimbabwe were spread a thousand years ago by Arab traders sailing between the Middle East and the east coast of Africa. The traders told of the fabulous wealth of a mysterious stone city in the African interior. In the trader's tales, that city became associated with the Europeans' understanding of Middle Eastern history—the Queen of Sheba, King Solomon and his legendary gold mines, long since lost to the world. By the sixteenth century, Portuguese explorers regularly visited East Africa, searching for King Solomon's gold, but they never found Great Zimbabwe. In 1552, a Portuguese historian, João de Barros, recorded a story told by Arabs about a city with a "square fortress of masonry within and without, built of stones of marvelous size, and there appears to be no mortar joining them."

3 In fact, Great Zimbabwe *was* a marvel. In one area a massive wall more than thirty feet high and twenty feet thick created a great enclosure. Another area contained a fortress-like series of walls, corridors, and steps built into the bluff that overlooks the ruins. Throughout the city, each stone was precisely fitted to the others without the use of mortar.

4 In the 1870s Karl Mauch, a German geologist, was the first European to see Great Zimbabwe, by then in ruins. Mauch realized that he had "rediscovered" the fabled city from de Barros's story. He jumped to the conclusion that Great Zimbabwe had been built by the Queen of Sheba. British authorities sent a British journalist, Richard Hall, to Great Zimbabwe to investigate Mauch's report. Archaeology was still in its infancy, and Hall, convinced that the structures had been built by ancient people from the Middle East, dug up and discarded archaeological deposits that would have revealed much about the true history of Great Zimbabwe. Later European excavations destroyed even more valuable evidence.

5 In the twentieth century, after excavating areas that had not been disturbed, David Randall-MacIver, a Scottish Egyptologist, and Gertrude Caton-Thompson, an English archaeologist, concluded that the ruins were unmistakably African in origin. Great Zimbabwe was most likely built during the fourteenth or fifteenth century by the ancestors of the present-day Shona people. Recent carbon-14 dating supports their conclusion. Great Zimbabwe was once home to an estimated 20,000 people, the center of a great Shona kingdom. Wealthy Shona kings traded their ivory and gold in coastal towns for other goods, thus accounting for the discovery of beads and other foreign wares in the ruins.

6 One mystery of Great Zimbabwe had been solved. Another mystery remains: why was the settlement at Great Zimbabwe abandoned, leaving the magnificent stone architecture to fall into ruins?

START SHSAT PREP

26. Which statement best describes the central idea of the passage?

E. Great Zimbabwe was an enormous stone city thought to be home to some of the greatest treasure of ancient history.

F. Mysteries related to Great Zimbabwe continue to interest historians and explorers even though archaeologists have confirmed its origins.

G. The history of Great Zimbabwe was subject to much speculation until modern archaeologists definitively determined its origins.

H. Early missteps in the study and excavation of the Great Zimbabwe ruins led to the loss of valuable evidence about the city.

27. What was the main way that Karl Mauch's conclusions about Great Zimbabwe in paragraph 4 affected later archaeological investigations?

A. Archaeologists from all over Europe became interested in excavating the area.

B. Archaeologists made assumptions about the history of the ruins before excavating.

C. Archaeologists started to believe that many of the past accounts recorded about the ruins were true.

D. Archaeologists realized it was unlikely that an ancient culture could build such grand structures.

28. Which statement best describes Portuguese explorers' experience searching for Great Zimbabwe?

E. They routinely visited East Africa but never located the city.

F. They were motivated by the hope of finding a mysterious city.

G. They used details from de Barros's story in order to determine the city's exact location.

H. They studied history books in order to gather information about the city.

29. What was "one mystery of Great Zimbabwe" (paragraph 6) that had been solved?

A. why the settlement was abandoned

B. where the ivory and gold from the city went

C. why the ruins remained undiscovered until the 1870s

D. who had built the settlement

START SHSAT PREP

Ode to Fireworks

In autumn my mother drove us to the edge of the field
where the fair was set up year after year:
the carousel, the bumper cars, the long, low sheds
filled with prizewinning animals.
We—my sister, my cousin, and I—were ready for bed,
already in our pajamas. This was a treat we waited
all year for. We waited in the darkness
for the first low, dull *thwumps*, like someone
beating an old, filthy rug hung on a wash line.
Then we counted the seconds between the lightning
and thunder, as we also used to do, until the sky
lit up: red, blue, green, gold. In my mind's eye
I can still see the straggly, ancient oak whose branches
reached up past the exhibition halls, silhouetted
against the spectrum of stars that cascaded behind it.

It was one thing to look up into the sky
and imagine yourself in it or to make out pictures
among the clouds, which my sister liked to do.
No, I would tell her, that cloud
does *not* look like an elephant, a hat, an umbrella.
But it was another thing to see
the sky at night written upon
with those jewels. (We lived in the country:
night was *night*.) All around us, crickets
stridulated in the stubble of what had been
somebody's cornfield, their song rising and falling.
You could smell winter on the air's edge.

Now, in the city, when the sky dips into shadow
at New Year's or on the Fourth of July, I find myself
craning my neck upward at odd moments.
The city sky is always lit up. This is where we live now,
and it is how we live now, awash in light
of every hue. Everything is a constant celebration:
picking up washing at the cleaner's or stopping by
the corner market for a loaf of heavy bread.
And the music around me is the music of people,
their voices rising and falling in a hundred languages.
But beneath the yellowish glow deep in the sky
of all our city lights pelting out into the universe,
I remember the feel of the pickup truck bumping
across the ridged field, as I kept waiting for those
childhood bursts, watching as they escorted us home.

START SHSAT PREP

33. The comparison in lines 8–9 of the poem is used to convey

A. the muffled pounding of explosions in the distance.
B. the way lightning streaks through the clouds.
C. the echoes of thunder on an autumn night.
D. the glow of sparks falling from the sky.

34. Read lines 22–23 from the poem.

the sky at night written upon
with those jewels.

What does the word choice in these lines convey about the speaker?

E. The speaker values material possessions.
F. The speaker imagines that the fireworks are magical.
G. The speaker believes that the country setting is distinctive.
H. The speaker cherishes the memory of seeing fireworks as a child.

35. The use of italics on the word "*night*" in line 24 is most likely intended to emphasize the

A. sense of mystery in the darkness.
B. sense of absolute darkness.
C. speaker's fear of night.
D. speaker's certainty about that night.

36. What is the purpose of the repeated words "rising and falling" in lines 26 and 37?

E. to create a distinction between solitude and meaningful interaction
F. to demonstrate a connection between the speaker's past and present
G. to emphasize the speaker's attention to the surrounding sounds
H. to compare the fireworks to common sights and sounds

37. What impact does the phrase "Everything is a constant celebration" (line 33) have in the poem?

A. It reveals that the speaker finds the city more pleasurable than the country.
B. It suggests that the persistent brightness of the city can be overwhelming to the speaker.
C. It implies that what is normal in the city was unusual in the country.
D. It emphasizes the hectic pace of daily life in the city.

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 someone stands completely motionless, creating no friction.

The pressure theory [illegible] 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 move only up and down; if they also moved side to side they would constitute a true liquid. Thus it could be said that people are skating on vibrating 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 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 ▶

Excerpt from *In Search of the Unknown*

by Robert W. Chambers

1 It was at that time the policy of the trustees and officers of the Zoological Gardens neither to employ collectors nor to send out expeditions in search of specimens. The society decided to depend upon voluntary contributions, and I was always busy, part of the day, in dictating answers to correspondents who wrote offering their services as hunters of big game, collectors of all sorts of fauna, trappers, snarers, and also to those who offered specimens for sale, usually at exorbitant rates.

2 To the proprietors of . . . mangy lynxes, moth-eaten coyotes, and dancing bears I returned courteous but uncompromising refusals—of course, first submitting all such letters, together with my replies, to Professor Farrago.

3 One day towards the end of May, however, just as I was leaving Bronx Park to return to town, Professor Lesard, of the reptilian department, called out to me that Professor Farrago wanted to see me a moment; so I . . . retraced my steps to the temporary, wooden building occupied by Professor Farrago, general superintendent of the Zoological Gardens. The professor, who was sitting at his desk before a pile of letters and replies submitted for approval by me, pushed his glasses down and looked over them at me with a whimsical smile that suggested amusement, impatience, annoyance, and perhaps a faint trace of apology.

4 "Now, here's a letter," he said, with a deliberate gesture towards a sheet of paper impaled on a file—"a letter that I suppose you remember." He disengaged the sheet of paper and handed it to me.

5 "Oh yes," I replied, with a shrug; "of course the man is mistaken—or—"

6 "Or what?" demanded Professor Farrago, tranquilly, wiping his glasses.

7 "—Ora liar," I replied.

8 After a silence he leaned back in his chair and bade me read the letter to him again, and I did so with a contemptuous tolerance for the writer, who must have been either a very innocent victim or a very stupid swindler. I said as much to Professor Farrago, but, to my surprise, he appeared to waver.

9 "I suppose," he said, with his near-sighted, embarrassed smile, "that nine hundred and ninety-nine men in a thousand would throw that letter aside and condemn the writer as a liar or a fool?"

10 "In my opinion," said I, "he's one or the other."

11 "He isn't—in mine," said the professor, placidly.

12 "What!" I exclaimed. "Here is a man living all alone on a strip of rock and sand between the wilderness and the sea, who wants you to send somebody to take charge of a bird that doesn't exist!"

START SHSAT PREP

13 "How do you know," asked Professor Farrago, "that the bird in question does not exist?"

14 "It is generally accepted," I replied, sarcastically, "that the great auk has been extinct for years. Therefore I may be pardoned for doubting that our correspondent possesses a pair of them alive."

15 "Oh, you young fellows," said the professor, smiling wearily, "you embark on a theory for destinations that don't exist."

16 He leaned back in his chair, his amused eyes searching space for the imagery that made him smile.

17 "Like swimming squirrels, you navigate with the help of Heaven and a stiff breeze, but you never land where you hope to—do you?"

18 Rather red in the face, I said: "Don't you believe the great auk to be extinct?"

19 "Audubon[1] saw the great auk."

20 "Who has seen a single specimen since?"

21 "Nobody—except our correspondent here," he replied, laughing.

22 I laughed, too, considering the interview at an end, but the professor went on, coolly:

23 "Whatever it is that our correspondent has—and I am daring to believe that it *is* the great auk itself—I want you to secure it for the society."

24 When my astonishment subsided my first conscious sentiment was one of pity. Clearly, Professor Farrago was on the verge of dotage[2]—ah, what a loss to the world!

25 I believe now that Professor Farrago perfectly interpreted my thoughts, but he betrayed neither resentment nor impatience. I drew a chair up beside his desk—there was nothing to do but to obey, and this fool's errand was none of my conceiving.

26 Together we made out a list of articles necessary for me and itemized the expenses I might incur, and I set a date for my return, allowing no margin for a successful termination to the expedition.

27 "Never mind that," said the professor. "What I want you to do is to get those birds here safely. Now, how many men will you take?"

28 "None," I replied, bluntly; "it's a useless expense, unless there is something to bring back. If there is I'll wire you, you may be sure."

29 "Very well," said Professor Farrago, good-humoredly, "you shall have all the assistance you may require. Can you leave to-night?"

START SHSAT PREP

1 **Audubon:** John James Audubon, an ornithologist and artist who created scientific illustrations of birds

2 **dotage:** a loss of reasoning brought about by old age

30 The old gentleman was certainly prompt. I nodded, half-sulkily, aware of his amusement.

31 "So," I said, picking up my hat, "I am to start north to find a place called Black Harbor, where there is a man named Halyard who possesses, among other household utensils, two extinct great auks—"

32 We were both laughing by this time. I asked him why on earth he credited the assertion of a man he had never before heard of.

33 "I suppose," he replied, with the same half-apologetic, half-humorous smile, "it is instinct. I feel, somehow, that this man Halyard *has* got an auk—perhaps two. I can't get away from the idea that we are on the eve of acquiring the rarest of living creatures. It's odd for a scientist to talk as I do; doubtless you're shocked—admit it, now!"

But I was not shocked; on the contrary, I was conscious that the same strange hope that Professor Farrago cherished was beginning, in spite of me, to stir my pulses, too.

34 "If he has—"I began, then stopped.

35 The professor and I looked hard at each other in silence.

36 "Go on," he said, encouragingly.

37 But I had nothing more to say, for the prospect of beholding with my own eyes a living specimen

38 of the great auk produced a series of conflicting emotions within me which rendered speech profanely superfluous.

From IN SEARCH OF THE UNKNOWN by Robert W. Chambers—Public Domain

40. Read paragraph 2 from the excerpt.

To the proprietors of . . . mangy lynxes, moth-eaten coyotes, and dancing bears I returned courteous but uncompromising refusals—of course, first submitting all such letters, together with my replies, to Professor Farrago.

This paragraph helps develop the plot by establishing that the narrator

E. dislikes writing refusal letters for the animals offered to the zoological society.

F. attempts to predict what the professor would say in the refusal letters.

G. believes that many of the animals offered are not acceptable for the zoological society.

H. resents the professor's insistence on reviewing the refusal letters.

START SHSAT PREP

41. Read this sentence from paragraph 3.

The professor, who was sitting at his desk before a pile of letters and replies submitted for approval by me, pushed his glasses down and looked over them at me with a whimsical smile that suggested amusement, impatience, annoyance, and perhaps a faint trace of apology.

What does the phrase "a faint trace of apology" convey about the professor?

A. It indicates that the professor feels bad that he has to call the narrator to his office after work.

B. It shows that the professor is hesitant to share his opinions with the narrator.

C. It implies that the professor is uncomfortable criticizing the narrator's work.

D. It suggests that the professor knows that the conversation will be frustrating for the narrator.

42. How does the exchange between the professor and the narrator in paragraphs 8–11contribute to the development of the characters?

E. It establishes the conflict between the professor and the narrator concerning the validity of the letter.

F. It suggests a theme of collaboration because the narrator and the professor regularly work together.

G. It reveals the characters' traits by contrasting the narrator's distrust with how easily the professor is deceived by what he reads.

H. It hints that the resolution will involve the narrator accepting the professor's opinion about the content of the letter.

43. The professor's observations in paragraphs 15–17create tension in the excerpt by causing the narrator to feel

A. flustered by the professor's criticism of his logic.

B. annoyed by the professor's sarcasm about his inexperience.

C. confused by the professor's lack of respect for his opinion.

D. frustrated by the professor's lack of interest in his theory.

START SHSAT PREP

44. How does the interaction between the narrator and the professor in paragraphs 26–28contribute to the development of the theme?

E. It illustrates the professor's patience as the narrator argues against making the expedition.

F. It reveals the narrator's frustration with his limited role in making decisions for the zoological society.

G. It emphasizes the professor's desire to acquire new specimens for the zoological society at any cost.

H. It shows the narrator's acceptance of his assignment despite his personal objections.

45. Which sentence from the excerpt best explains why the professor is eager to send the narrator on an expedition?

A. "I believe now that Professor Farragoperfectly interpreted my thoughts, but he betrayed neither resentment nor impatience." (paragraph 25)

B. "Together we made out a list of articles necessary for me and itemized the expenses I might incur, and I set a date for my return, allowing no margin for a successful termination to the expedition." (paragraph 26)

C. " 'What I want you to do is to get those birds here safely.' "(paragraph 27)

D. " 'I can't get away from the idea that we are on the eve of acquiring the rarest of living creatures.' "(paragraph 33)

46. How does paragraph 34 help develop the plot of the excerpt?

E. It shows that the narrator is beginning to consider the possibility of finding the great auks.

F. It demonstrates that the narrator is struggling to understand why the professor thinks the great auks exist.

G. It establishes that the narrator is willing to let the professor overrule him about the great auks.

H. It emphasizes that the narrator feels a sense of urgency to complete the expedition to locate the great auks.

START SHSAT PREP

For centuries, scientists were confounded by an animal that seemed to look and act like a combination of a bird, a reptile, and a mammal. It has a bill like a duck and lays eggs but produces milk for its young. It lives in a burrow, has fur, and can make venom. We now know that this animal is called a duck-billed platypus. A platypus is a monotreme, a type of egg-laying mammal.

Excerpt from "Research Riddle Resolved"

1 Hundreds of years after the first sightings of the platypus, the animal still captures our imagination anew and irresistibly attracts the attention of science writers everywhere. The May 2008 *Nature* report detailing the DNA insides of the duck-billed platypus invited colorful tales from just about every mainstream media outlet.

2 But cuteness and weirdness aside, the platypus research results are a gold mine for medical researchers. The findings cement what may have seemed totally obvious but turned out to be a bit of a scientific surprise: platypus DNA is a patchwork of genes from reptiles, birds, and mammals.

Evolution Fusion

3 In other words, the platypus heritage is laid out in an evolutionary DNA tapestry that marks the time, hundreds of millions of years ago, when reptiles and mammals branched off the evolutionary tree.

4 So what? The platypus is nothing like a human, so what can its DNA tell us about people and the diseases we get?
Plenty, says an international team of scientists who did this work.

5 The platypus genome results are far more than confirmation of a scientific oddity. They provide
6 researchers a window into a time in history when mammals became unique—gaining the ability to bear live young, produce milk for them, and grow a warm, furry coat.

7 That's important because our own, modern-day genomes are still a big mystery and researchers need much more information to be able to translate our genetic language into useful health knowledge.

8 One of the ways scientists can decipher meaning from within our 3 billionDNA "letters," or nucleotides, is to compare human genes with those from animals, to see what has been kept the same and what has evolved to be different. . . .

Same and Different

9 In an approach called comparative genomics, scientists compare the genome sequences of several species: human, mouse, and a wide variety of other organisms from single-celled fungi to elephants and, now, the platypus.

10 The goal of this research is to find regions of similarity and difference in order to better understand the structure and function of human genes.

START SHSAT PREP

11 Comparative genomics is directly related to evolution because all living things share a common ancestor. By using computer tools to examine genes that have been kept the same in many organisms over millions of years, researchers can locate signals that control how genes work. This information may translate into ways to understand, treat, and prevent human diseases. . . .

Chicken or Egg?

12 When researchers analyzed platypus DNA and compared it to that of chickens, snakes, and lizards, the findings traced the evolutionary path from birds and reptiles to mammals. They learned that the platypus lost most of its genetic ability to produce egg yolk—as compared to chicken genes. This suggests its departure from "chicken-ness."

13 But, through evolutionary change, the platypus gained the ability to make milk that is rich in nutrients. Platypuses have genes that make the milk protein casein: just like we do.

14 A male platypus can, like its ancestral snake and lizard cousins, produce venom. The platypus ejects this venom through special glands in its back legs. The evolutionary reason for maintaining such molecular weaponry isn't yet clear, but what is fascinating is that it appears nature mixed and matched together DNA pieces separately to create the venom genes in reptiles and monotremes like the platypus.

15 The scientific value of pinning genetics to physiological function—like milk production—is high. Such investigations may help medical researchers understand health issues related to reproduction and lactation. Although lactation is an ancient reproductive trait, mammals—including the platypus—are unique in their ability to produce milk that is extraordinarily nutritious, containing a rich blend of sugars, fats, and proteins.

16 More generally, though, studying how nature cuts and pastes gene modules gives scientists an inside scoop on how genetic changes relate to health and disease risk.

17 One thing is clear—the stunning blend of reptile, bird, and mammal puts the platypus in a class of its own, and it gives researchers much more: information about how mammals like us came about.

18 [Scientists'] genetic sleuthing of platypuses, chimps, fish, sunflowers—you name it—continues to teach scientists how millions of years of evolution progressed. This provides vital information to understanding the role of genes in the health and disease of mammals like us and our pets, and can also help preserve our rich and diverse planet.

From "Research Riddle Resolved"—Public Domain/National Institutes of Health

START SHSAT PREP

49. Read this sentence from paragraph 2.

But cuteness and weirdness aside, the platypus research results are a gold mine for medical researchers.

The sentence contributes to the overall structure of the excerpt by

A. shifting the focus of the excerpt from the platypus's unique appearance to its physiology.

B. highlighting how the platypus's unusual appearance has attracted scientists' attention.

C. revealing current ideas about the genetic background of the platypus.

D. introducing the platypus's scientific significance that the rest of the excerpt develops.

50. The phrase "evolutionary DNA tapestry" in paragraph 3conveys the idea that the platypus

E. has a rich and diverse genetic history linked to reptiles, birds, and other mammals.

F. was able to develop its mammalian and reptilian traits at different points in time.

G. continues to be the best resource for studying the evolution of animal genomes.

H. is especially useful to researchers because its genes have never been altered.

51. How do paragraphs 4–6 contribute to the development of ideas in the excerpt?

A. They summarize the evidence that the platypus genome is an evolutionary peculiarity.

B. They provide a transition from the discussion about the study of the platypus to a discussion about the study of the human genome.

C. They highlight the idea that mammals share several significant similarities even though the group is diverse.

D. They explain why the platypus's genetic material is interesting to researchers who are trying to understand humans and other mammals.

52. How does paragraph 8 fit into the overall structure of the excerpt?

E. It provides a transition from the discussion of the platypus genome to a discussion on comparative genomics.

F. It introduces the way that scientists study the evolution of genetic material within a particular species of animal.

G. It contrasts the efforts made to study the different parts of the human genome with the efforts made to study certain animal genomes.

H. It elaborates on the idea that deciphering genetic signals is a rigorous research challenge.

START SHSAT PREP

53. Which sentence gives the best summary of the section "Same and Different" (paragraphs 9–11)?

A. The platypus is the most recent of several species whose genomes have been compared with the human genome.
B. Comparative genomics is an effective way to examine a variety of different species, from single-celled organisms to large mammals.
C. Comparing human and animal genes and studying which genes are the same across species may lead to a greater understanding of human diseases.
D. Scientists are able to use computers in order to compare and examine evolutionary changes in genes across a number of species, including humans.

54. The details in paragraphs 12–14about the platypus's different abilities convey a central idea of the excerpt by

E. showing that the platypus has a gene that allows it to produce milk that is rich in nutrients, as humans do.
F. proving that the platypus, whose DNA is made up of DNA from several other species, has developed venom to defend itself.
G. suggesting that the platypus, while gaining traits in common with mammals and reptiles, has lost some bird-like traits.
H. demonstrating that the platypus has a rare evolutionary background that includes bird, reptile, and mammal DNA.

55. Which sentence from the excerpt best supports the idea that the same DNA material results in the same traits even in different classes of animals?

A. "The findings cement what may have seemed totally obvious but turned out to be a bit of a scientific surprise: platypus DNA is a patchwork of genes from reptiles, birds, and mammals." (paragraph 2)

B. "In other words, the platypus heritage is laid out in an evolutionary DNA tapestry that marks the time, hundreds of millions of years ago, when reptiles and mammals branched off the evolutionary tree." (paragraph 3)

C. "The platypus is nothing like a human, so what can its DNA tell us about people and the diseases we get?" (paragraph 4)
D. "The evolutionary reason for maintaining such molecular weaponry isn't yet clear, but what is fascinating is that it appears nature mixed and matched together DNA pieces separately to create the venom genes in reptiles and monotremes like the platypus." (paragraph 14)

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.

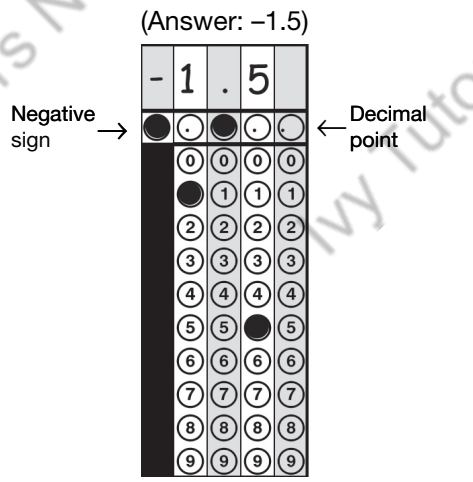
(5) Reduce (simplify) all fractions to lowest terms.

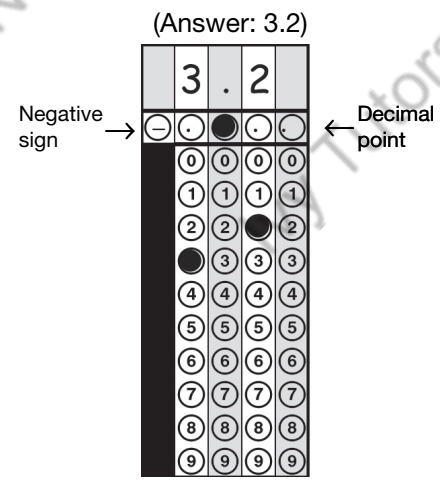
GRID-IN QUESTION NOTES

(1) For each grid-in question, write your answer at the top of the grid.

(2) Begin recording your answer in the columns on the far left.

(3) Fill in the circle under the box that matches the number or symbol you wrote. Leave the negative sign bubble blank if your answer is positive.





CONTINUE TO THE NEXT PAGE ►

START SHSAT PREP

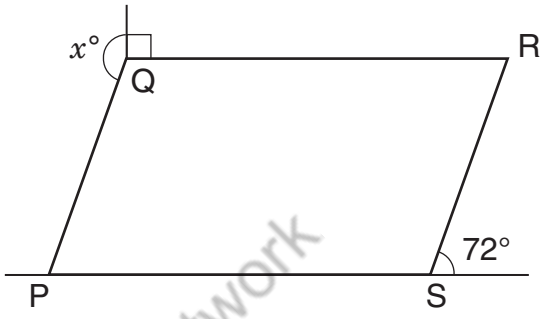
GRID-IN QUESTIONS

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.



In the figure above, PQRS is a parallelogram. What is the value of x?

59. The owner of a tree farm plants pine trees and oak trees in a ratio of 8:3. How many oak trees are planted if 264 pine trees are planted?

60. For what value of w is $4w = 2w - 8$?

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. The set of possible values of m is $\{5, 7, 9\}$. What is the set of possible values of k if $2k = m + 3$?

A. $\{3, 4, 5\}$
B. $\{4, 5, 6\}$
C. $\{8, 10, 12\}$
D. $\{10, 14, 18\}$

64. $7 + (3n + 6) - (4n + 8) =$

E. $5 - n$
F. $5 + n$
G. $21 - n$
H. $21 + n$

65. In a certain school, course grades range from 0 to 100. Adrianna took 4 courses and her mean course grade was 90. Roberto took 5 courses. If both students have the same sum of course grades, what was Roberto's mean?

A. 72
B. 80
C. 90
D. 92

66. Jenny starts a game with twice as many marbles as Keiko. Jenny gives Keiko 5 marbles, but she still has 10 more than Keiko. How many marbles did Jenny have to start with?

E. 25
F. 30
G. 35
H. 40

START SHSAT PREP

67. In a scale diagram, 0.125 inch represents 125 feet. How many inches represent 1 foot?

A. 0.001
B. 0.01
C. 0.1
D. 0.12

68.

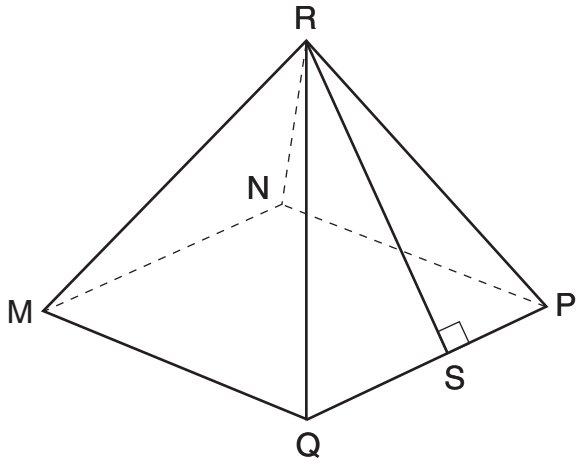
PEOPLE PER VEHICLE AT CHECKPOINT

Number of People in Vehicle	Percent of Vehicles
1	40%
2	35%
3	15%
4	7%
5 or more	3%

A researcher recorded the number of people in each vehicle that passed through a checkpoint. The table above shows the percent distribution for the 420 vehicles that passed through the checkpoint yesterday morning. How many of the 420 vehicles contained **at least** 3 people?

E. 42
F. 63
G. 105
H. 315

69.



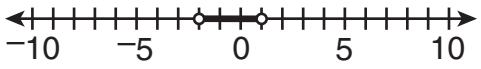
In the pyramid above, each triangular face has the same area, and the base MNPQ is a square that measures 8 centimeters on each side. If the length of $\overline{RS}$ = 6 centimeters, what is the surface area of the pyramid **excluding** the base?

A. 48 sq cm
B. 96 sq cm
C. 128 sq cm
D. 160 sq cm

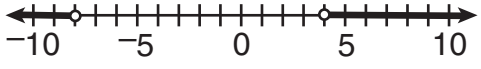
70. The perimeter of a rectangle is 510 centimeters. The ratio of the length to the width is 3:2. What are the dimensions of this rectangle?

E. 150 cm by 105 cm
F. 153 cm by 102 cm
G. 158 cm by 97 cm
H. 165 cm by 90 cm

71. Which number line below shows the solution to the inequality $-4 < \frac{x}{2} < 2$?

A.


B.


C.


D.


72. The sum of the numbers x, y, and z is 50. The ratio of x to y is 1:4, and the ratio of y to z is 4:5. What is the value of y?

E. 4
F. 8
G. 10
H. 20

73. A box of colored pencils contains exactly 6 red pencils. The probability of choosing a red pencil from the box is $\frac{2}{7}$. How many of the pencils in the box are **not** red?

A. 5
B. 15
C. 21
D. 30

74. 1 dollar = 7 lorgs

1 dollar = 0.5 dalt

Kevin has 140 lorgs and 16 dalts. If he exchanges the lorgs and dalts for dollars according to the rates above, how many dollars will he receive?

E. $28
F. $52
G. $182
H. $282

START SHSAT PREP

79.

1 sind = 4 lorgs

2 plunks = 5 dalts

5 sinds = 2 harps

1 plunk = 3 harps

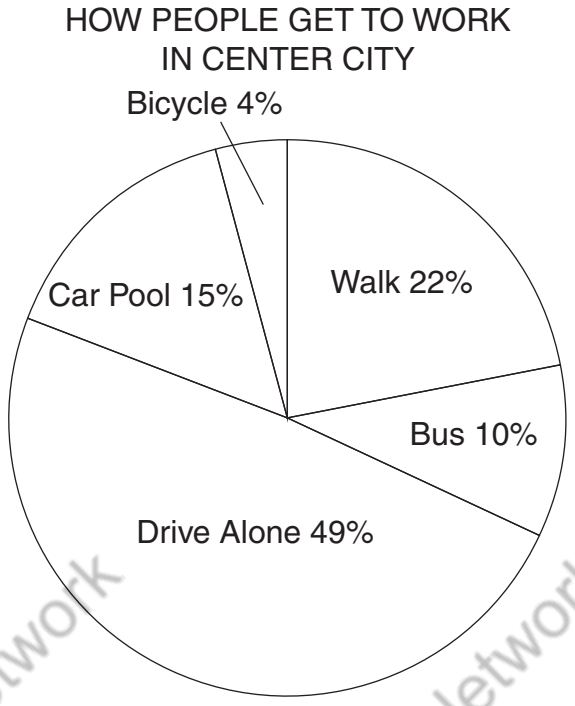
A nation has five types of coins: sinds, dalts, lorgs, harps, and plunks. The relationship between the coins is shown above. Which coin is most valuable?

A. sind
B. dalt
C. harp
D. plunk

80. The faculty of a certain four-year college consists of 179 teachers. There are 663 first-year students. The student-to-faculty ratio for the entire college is 15 to 1. What is the total number of second-, third-, and fourth-year students?

E. 1,989
F. 2,022
G. 2,652
H. 2,685

81.



Total number of people working in Center City = 15,000

How many more people in Center City walk to work than ride their bicycle to work?

A. 2,500
B. 2,700
C. 2,800
D. 3,000

START SHSAT PREP

82. Which of the following numbers has factors that include the smallest factor (other than 1) of 91?

E. 30
F. 35
G. 39
H. 44

83. In a scale drawing of a triangular banner, one side measures 16 centimeters and the other two sides each measure 12 centimeters. On the actual banner, these two sides each measure 36 feet. What is the length of the remaining side of the actual banner?

A. 16 ft
B. 32 ft
C. 40 ft
D. 48 ft

84.

SCORES ON MATH QUIZ

Score	Number of Students
85	4
75	4
65	2

What is the mean score of the 10 students in the table above?

E. 22.5
F. 75
G. 77
H. 85

85. The least of 5 consecutive integers is l, and the greatest is g. What is the value of $\frac{l+g}{2}$ in terms of l?

A. $2l$
B. $3l$
C. $l+2$
D. $l+5$

START SHSAT PREP

91. There are 6 different cookies on a plate. Aiden will choose 2 of these cookies to pack in his lunch. How many different pairs of 2 cookies can he choose from the 6?

A. 12
B. 15
C. 30
D. 36

92. For a presentation, Deion can create 5 slides in 20 minutes, working at a constant rate. Kyra can create 3 slides in 10 minutes, working at her own constant rate. What is the total number of slides the two of them can create in one hour?

E. 16
F. 30
G. 33
H. 55

93.

On the number line above, LN = $\frac{1}{8}$. Point M (not shown) is located between point L and point N. Which value below is a possible value for M?

A. 4.26
B. 4.31
C. 4.35
D. 4.58

94. Johan leased a car for three years. He paid a one-time fee of $1,000, and an additional $300 per month for the full three years. At the end of the three years, what is the total amount Johan paid for leasing this car?

E. $1,900
F. $4,600
G. $10,800
H. $11,800

START SHSAT PREP

95. Ryan must read 150 pages for school this weekend. It took him 30 minutes to read the first 20 pages. At this rate, how much **additional** time will it take him to finish the reading?

A. $2\frac{1}{6}$ hr

B. $3\frac{1}{4}$ hr

C. $3\frac{3}{4}$ hr

D. $7\frac{1}{2}$ hr

96. Suppose $M = \frac{w}{x}$, $N = \frac{y}{z}$, and $w, x, y,$ and z do not equal 0. What is $\frac{M}{N}$ in terms of $w, x, y,$ and z?

E. $\frac{wx}{yz}$

F. $\frac{wy}{xz}$

G. $\frac{wz}{xy}$

H. $\frac{xy}{wz}$

97. In the set of consecutive integers from 12 to 30, inclusive, there are four integers that are multiples of both 2 and 3. How many integers in this set are multiples of **neither** 2 nor 3?

A. 5

B. 6

C. 13

D. 15

START SHSAT PREP

98. If $3n$ is a positive even number, how many **odd** numbers are in the range from $3n$ up to and including $3n + 5$?

E. 2

F. 3

G. 4

H. 5

99. A box contains 5 strawberry candies, 3 banana candies, and 2 orange candies. If Braden selects 2 candies at random from this box, without replacement, what is the probability that both candies are **not** banana?

A. $\frac{1}{15}$

B. $\frac{9}{100}$

C. $\frac{7}{15}$

D. $\frac{49}{100}$

100. $$\frac{w}{x} = \frac{y}{z}$$

In the equation above, w, x, y, and z are positive numbers. Which of these is equal to z?

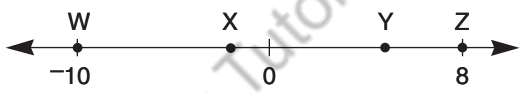
E. x

F. xy

G. $\frac{w}{xy}$

H. $\frac{xy}{w}$

101.



On the number line above, points W, X, Y, and Z are integers, and WX:XY:YZ = 4:2:3. What is the value of $\overline{WY}$?

A. 8

B. 11

C. 12

D. 18

START SHSAT PREP

102. A metal square used in an electronic device must have a thickness of 0.02 inch, with an allowable error of 1 percent. What is the **greatest** allowable thickness of the metal square?

E. 0.0002 in.

F. 0.02 in.

G. 0.0202 in.

H. 0.03 in.

103.

SCORES ON BIOLOGY TEST

Section	Lowest Score	Range
I	65	28
II	62	25
III	67	22

Mr. Blake's biology class is divided into three sections. The same test was given to each section. The table above shows both the lowest score and the range of scores on this test for each section. What is the **overall** range of all scores in all three sections?

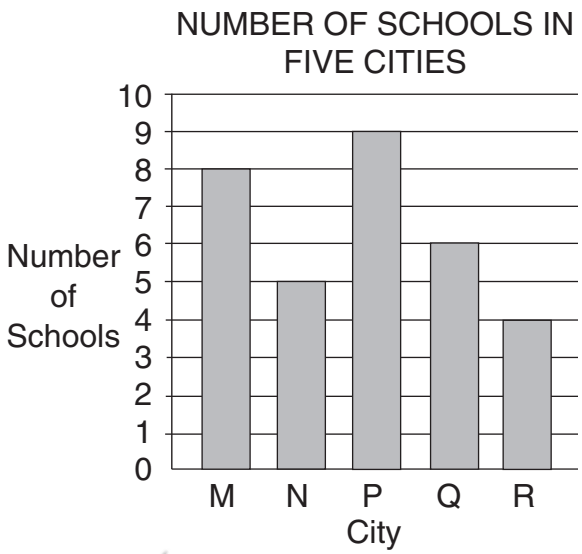
A. 25

B. 27

C. 28

D. 31

104.



The graph above shows the number of schools per city for five small cities. Cities M and N each have 500 students per school. City P has 400 students per school. Cities Q and R each have 700 students per school. Which of the five cities has the **greatest** number of students?

E. City M

F. City P

G. City Q

H. City R

110. Using the approximation 2.54 centimeters = 1 inch, how many centimeters are in 4 feet 7 inches?

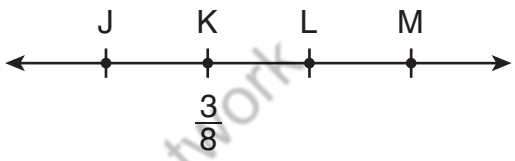
E. 21.65

F. 119.38

G. 121.92

H. 139.70

111.



On the number line above, JK = $3\frac{1}{2}$, JM = $9\frac{3}{4}$, and LM = $1\frac{1}{8}$. What is the position of point L?

A. $5\frac{1}{8}$

B. $5\frac{1}{4}$

C. $5\frac{1}{2}$

D. $6\frac{1}{4}$

112. If $4x - 3y = 12$, what is x in terms of y?

E. $x = \frac{3}{4}y + 12$

F. $x = -\frac{3}{4}y + 12$

G. $x = \frac{3}{4}y + 3$

H. $x = -\frac{3}{4}y + 3$

START SHSAT PREP