GRADE 8

A

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:

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 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: Print your student ID number in Grid 7. 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.

Grid 8: In most cases, Grid 8 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.

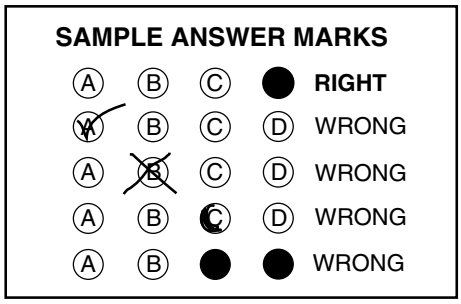
Now review Side 1 to make sure you have completed all lines and grids correctly. Review each column to see that the filled-in circles correspond to the letters or numbers in the boxes above them.

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

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.



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

Pearson

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

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

> In 1967 Katherine Switzer signed up for the Boston Marathon using her first and middle initials instead of her full name, at that time, only men were permitted to officially register and receive a number for the legendary race. Once officials realized a woman was attempting to run in the race, they made efforts to remove her from the competition. Switzer prevailed and finished in just over four hours, paving the way for the official rule change that allowed for the inclusion of women. In 2017, to mark the fiftieth anniversary of this pioneering event, a seventy-year-old Switzer repeated her run, wearing the number 261, the same number she had worn in that first run in 1967.

A. name. At

B. race. They

C. hours. Paving

D. 261. The

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

> (1) The blobfish, a creature that certainly resembles its name, is an unusual fish whose body is mostly composed of pink, gelatinous flesh. (2) Because it has very few muscles and its density is close to that of water, the blobfish spends its life floating slightly above the ocean floor. (3) It must wait patiently for whatever edible matter might float by its mouth. (4) The blobfish's downturned mouth, slimy skin, and pale coloring caused them to be voted the World's Ugliest Animal in 2013.

E. sentence 1

F. sentence 2

G. sentence 3

H. sentence 4

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.

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 10 provides 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.

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.

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 ►

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.

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.

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.

16. The author conveys a point of view on the study of animal intelligence mainly by

E. sharing details about experiments that tested the ability of an animal to plan for the future.

F. comparing the results of different experiments that were designed to test animal intelligence.

G. critiquing experiments that aimed to demonstrate that certain animals are capable of planning for the future.

H. explaining how modern experiments show that previously held beliefs about animal intelligence are inaccurate.

17. With which statement would the author of the passage most likely agree?

A. Scientists are unlikely to be able to conduct an experiment that can genuinely distinguish between instinctual and learned behaviors in animals.

B. Scientists should continue researching to determine whether or not animals can demonstrate advanced intelligence.

C. Scientists should be careful about making conclusions about animal intelligence based on experiments that rely on training animals.

D. Scientists can confirm data on whether animals have the ability to plan by performing experiments on additional species known for their intelligence.

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.

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[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

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.

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)

23. Read these sentences from the excerpt.

> **Mom seems to think of nothing farther away than today or perhaps yesterday or tomorrow morning.** (paragraph 1)
>
> **Mom was fixing oatmeal for tomorrow morning.** (paragraph 19)

The sentences help develop a central idea of the excerpt by

A. suggesting that practical people focus on current needs rather than worrying about the future.

B. showing that parents tend to consider the needs of their children before thinking of themselves.

C. revealing that it is sometimes important to plan ahead.

D. illustrating that dreaming about the future is a waste of time.

24. The flashback in paragraphs 10–24 affects the plot by

E. showing that the departure of one member of the family makes extra work for those left on the farm.

F. showing that the bond within the family persists even when its members are apart.

G. explaining why Ellen fears that leaving her parents will be too difficult.

H. illustrating the close connection Ellen has with both of her parents.

25. Which sentence from the excerpt provides evidence that Mom wants Ellen to understand the family's heritage?

A. "Mom folded the ironing board and put it inside their bedroom that was just off the kitchen." (paragraph 2)

B. " 'There's no need to go to town; she can catch the train at Gotham just as well.' " (paragraph 5)

C. "We'd go in right after dinner and go around to the stores, Dad going one way and Mom and I another." (paragraph 7)

D. " 'Why, Yeléna, you know that; Anna Petrovna.' " (paragraph 22)

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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,

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[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

26. 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.

27. A central idea that Lowell was "one of America's most significant industrial cities" (paragraph 1) is conveyed in the passage primarily through a description of the

A. canals, mills, and boardinghouses that were built by immigrants.

B. mill girls and immigrants who comprised Lowell's workforce.

C. development of the mills and the workforce established to support them.

D. cultural diversity of the people who lived in the area.

28. Which sentence from paragraph 2 best supports the idea that Lowell became "a bustling industrial city" (paragraph 1) in a short period of time?

E. "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."

F. "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."

G. "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."

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

29. 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?

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

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

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

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

30. 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?

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

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

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

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

31. Which sentence best summarizes the mill girls' experience as the dominant workforce in Lowell?

A. The mill girls were eager to leave their domestic duties and small towns behind, so they went to work in the mills of Lowell.

B. Originally, the mill girls were satisfied to work in Lowell, but as they left their jobs at the Lowell mills, immigrants arrived to fill the empty positions.

C. Young women left home to work in the Lowell mills, but the mill girls soon became dissatisfied with the working conditions and rigid boardinghouse rules.

D. The mill girls embraced city life when they came to work in Lowell's mills, but when their protests about unfavorable working conditions went unanswered, they left.

32. The reason Lowell lost its status as an industrial leader is best illustrated through the

E. description of poor living and working conditions.

F. explanation for why some immigrant groups struggled to live together.

G. comparison with other mills that used modern methods.

H. information about the mills opening temporarily during World War II.

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.

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.

38. Read lines 41–42 from the poem.

> **I kept waiting for those**
> **childhood bursts, watching as they escorted us home.**

How does this memory affect the speaker?

E. The speaker believes it is impossible to ever return to a place in the past.

F. The speaker is still amused by the impatience felt during fireworks displays.

G. The speaker now regrets abandoning the rural way of life.

H. The speaker feels a sense of comfort when reflecting on the past.

39. The fireworks in the poem represent the speaker's

A. wish to return to a simpler way of living.

B. bittersweet feelings about leaving the past behind.

C. high expectations for everyday life.

D. reflections on past interactions with relatives.

CONTINUE 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 "—Or a 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!"

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?"

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[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!"

34 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.

35 "If he has—" I began, then stopped.

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

37 "Go on," he said, encouragingly.

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

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 8–11 contribute 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 15–17 create 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.

44. How does the interaction between the narrator and the professor in paragraphs 26–28 contribute 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 Farrago perfectly 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.

47. Which sentence best demonstrates the professional relationship between the narrator and the professor?

A. "He disengaged the sheet of paper and handed it to me." (paragraph 4)

B. "Clearly, Professor Farrago was on the verge of dotage—ah, what a loss to the world!" (paragraph 24)

C. "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." (paragraph 25)

D. " 'Very well,' said Professor Farrago, good-humoredly, 'you shall have all the assistance you may require.' " (paragraph 29)

48. How does the author develop the contrast between the narrator's point of view and the professor's point of view?

E. by providing both the narrator's and professor's thoughts on how age and experience influence each other's reasoning

F. by using the conversation between the narrator and the professor to emphasize their reactions to the letter

G. by describing the professor's persistent efforts to change the narrator's mind about the letter

H. by including dialogue that explains why the professor is the supervisor and the narrator is his subordinate

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?

5 Plenty, says an international team of scientists who did this work.

6 The platypus genome results are far more than confirmation of a scientific oddity. They provide 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 billion DNA "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.

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

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 3 conveys 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.

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 12–14 about 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)

56. How can researching the genomes of other animals inform scientists' understanding of human health and disease?

E. Tracking how other animals evolved over millions of years helps researchers preserve and sustain nature.

F. Finding ways that animal genomes are similar to the human genome helps researchers find signals that control genes.

G. Observing that all living things evolved from a common ancestor helps researchers pinpoint certain genetic traits.

H. Understanding how other animals are similar to one another helps researchers understand how humans evolved.

57. The author elaborates on the idea that creating a full analysis of platypus DNA was an important scientific endeavor mainly through

A. a description of the type of information about human genetics that specialized research can yield.

B. a comparison of the platypus with its closest bird and reptile relatives on the evolutionary tree.

C. the discussion of how unusual the platypus genome is in the animal kingdom.

D. the explanation of how genetics can be aligned to physiological function.

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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.

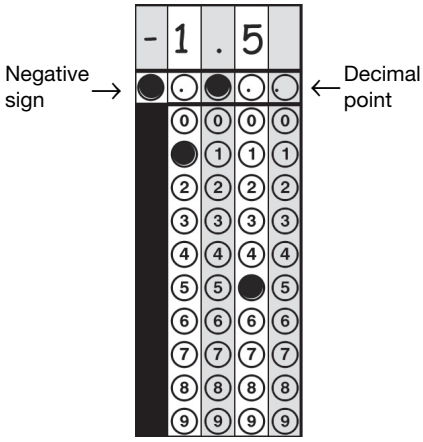
GRID-IN QUESTION NOTES

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

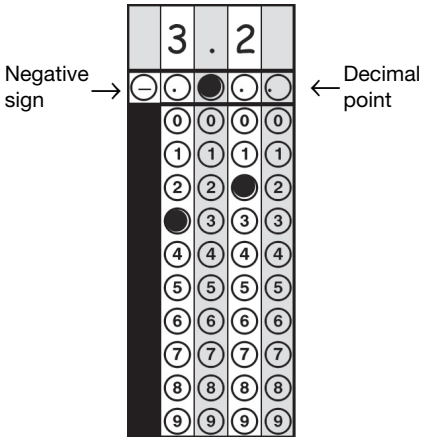
(2) Begin recording your answer in the columns on the far left.

(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.

(Answer: –1.5)



(Answer: 3.2)



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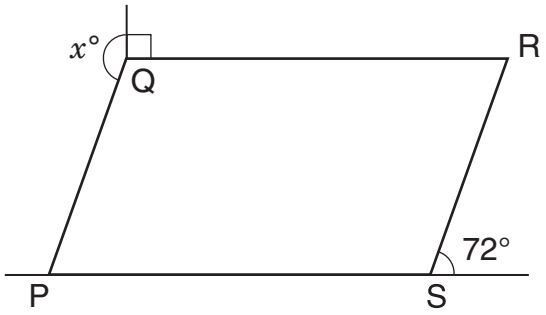
Grid-In Questions

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 $4w = 2w - 8$?

61. A survey asked students what pets they have. Based on the results, the following statements are all true.

- 20 students have cats.
- 23 students have dogs.
- 3 students have both dogs and cats.
- 5 students have no dogs or cats.

How many students were surveyed?

62. The sum of two consecutive integers is -15. If 1 is added to the smaller integer and 2 is subtracted from the larger integer, what is the **product** of the two resulting integers?

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

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.

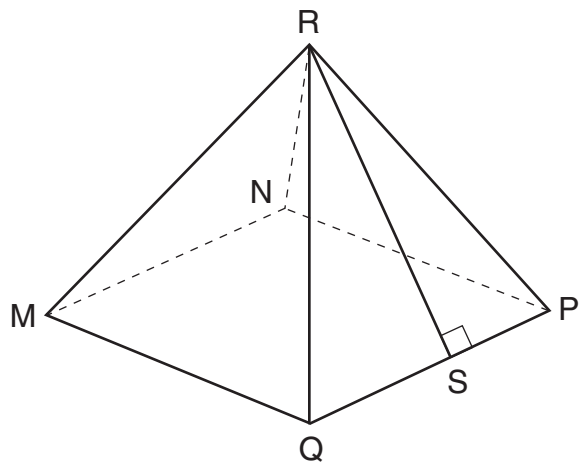
PEOPLE PER VEHICLE AT CHECKPOINT

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.



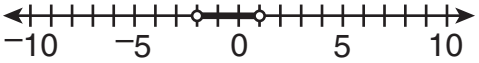
In the pyramid above, each triangular face has the same area, and the base MNPQ is a square that measures 8 centimeters on each side. If the length of $\overline{RS}$ = 6 centimeters, what is the surface area of the pyramid **excluding** the base?

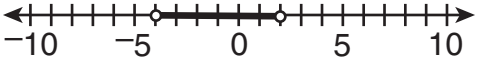
A. 48 sq cm
B. 96 sq cm
C. 128 sq cm
D. 160 sq cm

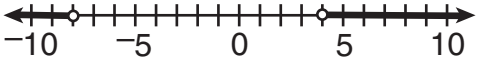
70. The perimeter of a rectangle is 510 centimeters. The ratio of the length to the width is 3:2. What are the dimensions of this rectangle?

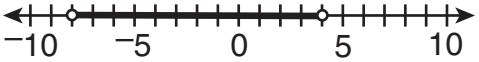
E. 150 cm by 105 cm
F. 153 cm by 102 cm
G. 158 cm by 97 cm
H. 165 cm by 90 cm

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

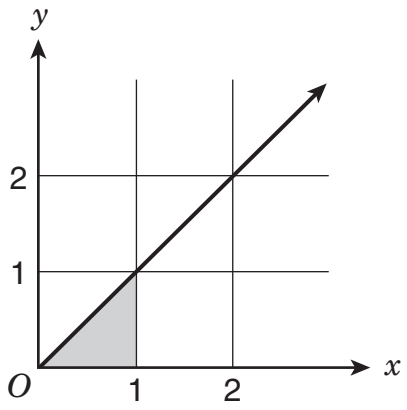
74. 1 dollar = 7 lorgs

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

75.



What is the area of the shaded region in the graph above?

A. 0.25 square unit
B. 0.5 square unit
C. 1 square unit
D. 1.5 square units

76. In Centerville, 45% of the population is female, and 60% of the population commutes to work daily. Of the total Centerville population, 21% are females who commute to work daily. What percentage of the total Centerville population are males who do **not** commute to work daily?

E. 15%
F. 16%
G. 24%
H. 39%

77. Mrs. Cranston bought five bottles of water for $0.90 each and 8 pounds of meat. She paid a total of $26.90 for these items, not including tax. What was the price per pound of the meat?

A. $2.80
B. $3.25
C. $14.40
D. $22.40

78. In a sample of 10 cards, 4 are red and 6 are blue. If 2 cards are selected at random from the sample, one at a time without replacement, what is the probability that both cards are **not** blue?

E. $\frac{2}{15}$
F. $\frac{4}{25}$
G. $\frac{3}{10}$
H. $\frac{1}{3}$

79.

1 sind = 4 lorgs

2 plunks = 5 dalts

5 sinds = 2 harps

1 plunk = 3 harps

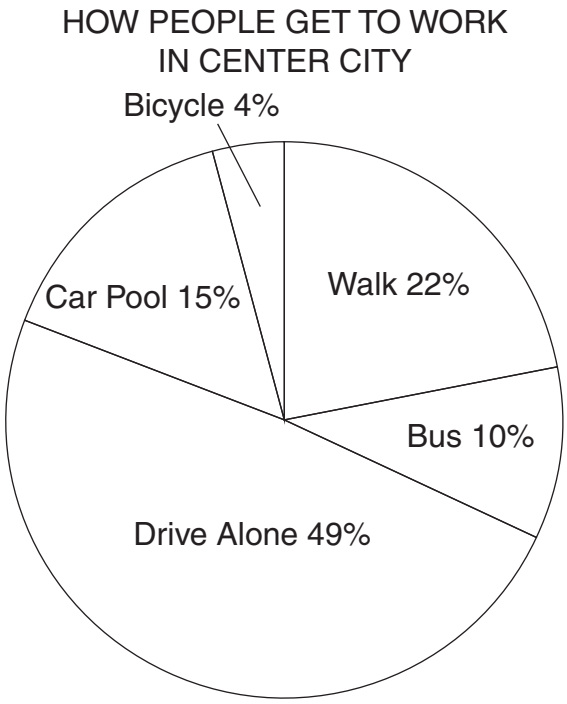
A nation has five types of coins: sinds, dalts, lorgs, harps, and plunks. The relationship between the coins is shown above. Which coin is most valuable?

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

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. $l+5$

86. A car is traveling 55 miles per hour, and 1 mile = 5,280 feet. Which of the following calculations would give the car's speed in **feet per second**?

E. $\frac{55 \cdot 5{,}280}{1}$

F. $\frac{55 \cdot 5{,}280}{3{,}600}$

G. $\frac{55 \cdot 3{,}600}{5{,}280}$

H. $\frac{55 \cdot 5{,}280}{60}$

87. Today, Tien's age is $\frac{1}{4}$ of Jordan's age. In 2 years, Tien's age will be $\frac{1}{3}$ of Jordan's age. How old is Jordan today?

A. 4 years old

B. 6 years old

C. 12 years old

D. 16 years old

88. How many positive even factors of 48 are greater than 24 and less than 48?

E. 0

F. 1

G. 2

H. 12

89.

$$2\frac{1}{5} + 3\frac{3}{10} + 4\frac{2}{5} + 5\frac{1}{2}$$

What is the value of the expression shown above?

A. $14\frac{7}{20}$

B. $14\frac{2}{5}$

C. $15\frac{7}{20}$

D. $15\frac{2}{5}$

90. An unmarked straight stick will be laid end over end to measure a distance of exactly 72 feet. The same stick will be used in the same way to measure a distance of exactly 30 feet. What is the length of the longest possible stick that can be used for both measurements?

E. 3 ft

F. 4 ft

G. 6 ft

H. 8 ft

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

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

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?

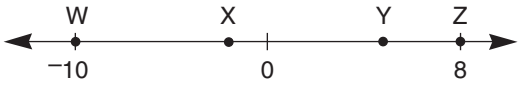
E. x

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

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.

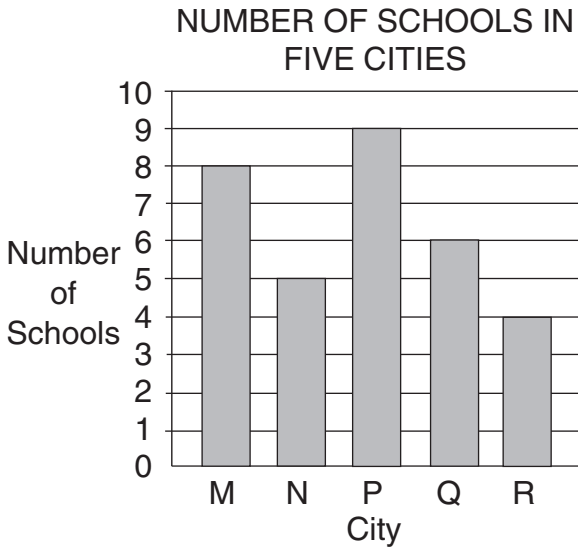
SCORES ON BIOLOGY TEST

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

105. $$\frac{10}{13} = 0.\overline{769230}$$

In the infinitely repeating decimal above, 7 is the first digit in the repeating pattern. What is the 391st digit?

A. 0
B. 3
C. 6
D. 7

106. A car travels at 4,400 feet per minute. The radius of each tire on the car is 1 foot. How many revolutions does one of these tires make in 1 minute? (Use the approximation $\frac{22}{7}$ for π.)

E. 700
F. 1,925
G. 13,828
H. 15,400

107. $100(2 + 0.1)^2 - 100 =$

A. 101
B. 200
C. 301
D. 341

108. A sports store has a container of handballs: 4 blue, 5 red, 8 yellow, 9 white, and 11 green. If one ball is picked from the container at random, what is the probability that it will be yellow?

E. $\frac{1}{37}$
F. $\frac{1}{8}$
G. $\frac{8}{37}$
H. $\frac{8}{29}$

109. Each week, Leon has fixed expenses of \$1,250 at his furniture shop. It costs him \$150 to make a chair in his shop, and he sells each chair for \$275. What is Leon's **profit** if he makes and sells 25 chairs in 1 week?

A. \$1,875
B. \$2,500
C. \$3,125
D. \$4,375

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

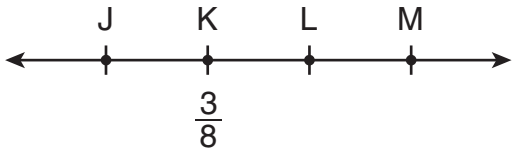
E. 21.65

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

113.

SERVINGS OF FRUITS AND VEGETABLES

Number of Servings of Fruits and Vegetables	Number of Students
0	5
1	7
2	3
3	4
4	0
5	1

There are 20 students in a class. The frequency table above shows the number of students in this class who ate 0, 1, 2, 3, 4, or 5 servings of fruits and vegetables yesterday. What is the mean number of servings of fruits and vegetables eaten yesterday per student in this class?

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

B. 3

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

D. 4

114. A paste used to cover a billboard is made by mixing the following ingredients by weight:
4 parts powder, 3 parts water, 2 parts resin, and 1 part hardener. To cover one billboard requires 30 pounds of this paste. How many total pounds of resin are required to cover 4 billboards?

E. 6

F. 8

G. 24

H. 48

THIS IS THE END OF THE TEST.
IF TIME REMAINS, YOU SHOULD CHECK YOUR ANSWERS. BE SURE THAT THERE ARE NO STRAY MARKS, PARTIALLY FILLED ANSWER CIRCLES, OR INCOMPLETE ERASURES ON YOUR ANSWER SHEET. ■

CONTINUE ON TO THE NEXT PAGE ▶

REVISING/EDITING PART A

1. The question asks which edit should be made to correct the sentence.

A. **CORRECT.** The sentence in the box needs a comma to separate the coordinate adjectives. Coordinate adjectives describe characteristics of the same noun or subject and are connected with a comma or "and." This option is the only one that places a comma where it is needed, between the coordinate adjectives "agile" and "athletic."

B. Incorrect. The option incorrectly adds a comma in the middle of the phrase "first and only," which modifies, or gives additional information about, "professional basketball player."

C. Incorrect. The option incorrectly adds a comma between two adjectives that are not coordinate adjectives. "Only" is part of the phrase "first and only" and is modifying "professional basketball player."

D. Incorrect. The option is incorrect because a comma is not needed to set off the phrase "to score 100 points in a single game."

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2. The question asks for the most precise revision for the words "The engineers tried some other things."

E. Incorrect. This revision uses the word "materials" rather than precisely identifying what the engineers used.

F. **CORRECT.** This option revises the words to be more precise by using the specific words "tested" for the verb and "foam and fiberglass" for the materials.

G. Incorrect. This revision uses the word "examined" rather than a word indicating a process of experimental trial and error. The sentence also uses the word "materials" rather than precisely identifying what the engineers used.

H. Incorrect. This revision identifies the materials, but the imprecise verb "worked with" does not specify what the engineers were doing.

3. The question asks for the revision that corrects the error in sentence structure in the paragraph.

A. **CORRECT.** As written, the first sentence ("In 1967 Katherine Switzer . . . legendary race.") is a run-on sentence because a comma is used to combine two independent clauses. Independent clauses are complete sentences with a subject and a verb. The clauses—"In 1967 Katherine Switzer signed up for the Boston Marathon using her first and middle initials instead of her full name" and "at that time, only men were permitted to officially register and receive a number for the legendary race"—should be separated with a period instead. This revision correctly places a period after the word "name" and capitalizes the word "At" to separate the two independent clauses into two sentences.

B. Incorrect. The revision introduces an error into the paragraph and does not revise the run-on in the first sentence. The clause "Once officials realized a woman was attempting to run in the race" is a dependent clause functioning as an adverb of the independent clause that follows it. Changing the comma after the word "race" to a period would incorrectly separate the adverbial dependent clause from the independent clause.

C. Incorrect. The revision introduces an error into the paragraph and does not revise the run-on in the first sentence. The sentence "Switzer prevailed and finished in just over four hours, paving the way for the official rule change that allowed for the inclusion of women" is a complex sentence, which combines an independent clause ("Switzer prevailed and finished in just over four hours") and a dependent clause ("paving the way for the official rule change that allowed for the inclusion of women"). The clause "paving the way for the official rule change that allowed for the inclusion of women" is not a complete sentence and must stay connected to the first part of the sentence. Changing the comma after "hours" to a period would incorrectly separate the dependent clause from the independent clause.

D. Incorrect. The revision introduces an error into the paragraph and does not revise the run-on in the first sentence. Changing the comma after "261" to a period would incorrectly separate the modifying clause "the same number she had worn in that first run in 1967" from the words it describes ("number 261"). Additionally, the clause "the same number she had worn in that first run in 1967" is not a complete sentence.

4. The question asks for the identification of the sentence that contains an error in its construction and should be revised.

E. Incorrect. There are no errors in sentence 1. The singular pronoun "its" matches the number of the word it refers to, the singular noun "blobfish." Additionally, the clause "a creature that certainly resembles its name" is correctly set off by commas to provide an additional, but not essential, detail about the blobfish. The comma separating "pink" and "gelatinous" is correct because these are coordinate adjectives.

F. Incorrect. There are no errors in sentence 2. The singular pronouns "it" and "its" match the number of the word they refer to, the singular noun "blobfish." Additionally, the structure of the sentence correctly shows that the clause "Because it has very few muscles and its density is close to that of water" modifies the words "the blobfish."

G. Incorrect. There are no errors in sentence 3. The "it" and "its" in the sentence refer to "the blobfish" mentioned in the previous sentence. The use of singular pronouns in sentence 3 is consistent with the rest of the paragraph.

H. **CORRECT.** Sentence 4 contains an error because the sentence uses the plural pronoun "them" to refer to "The blobfish's," which is singular in number. The word "them" should be changed to "it." The paragraph refers to the blobfish as a singular species in each of the four sentences, and sentence 4 should be revised to match.

REVISING/EDITING PART B

Cracking the Code

5. The question asks for the best way to combine sentences 3 through 5 to clarify the relationship between ideas.

A. Incorrect. While this sentence shows a relationship between the ideas, it does not clarify the relationship accurately. Learning the language of code does not depend on people's previous ability to construct programs that will perform detailed and complex tasks. The word "because" incorrectly indicates that people can already construct complex programs prior to learning the coding language that would allow them to do so.

B. **CORRECT.** This sentence accurately shows the relationship between the ideas of the sentences. Before people can construct programs that will perform detailed and complex tasks, they have to learn a coding language. Knowing that language will, in turn, allow them to build programs that can perform detailed and complex tasks.

C. Incorrect. This sentence does not accurately express the relationship between ideas because the sentence implies that some people who code do not have to learn the language to perform their job functions. The passage clearly states that "computer code is part of every electronic interaction" (sentence 1) and that "programmers use it to instruct computers to perform different tasks" (sentence 2).

D. Incorrect. The conditional (If . . . then) construction of the sentence in Option D does not convey the intended relationship of the ideas in the sentences. The "then" statement ("they can construct programs that will perform detailed as well as complex tasks") does not follow the condition of the "if" statement ("people who code have to learn this language").

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6. The question asks for the sentence that should follow sentence 5 to best state the main claim in the passage.

E. **CORRECT.** This sentence logically follows sentence 5 and introduces the main idea of the passage: that due to the high demand for coding skills across a wide range of industries and disciplines, learning basic coding skills can provide a range of opportunities for personal growth.

F. Incorrect. While this sentence incorporates a point made in the passage about how coding can benefit many occupational fields (sentence 10), this idea alone does not address the entire argument in the passage. This sentence does not capture the passage's emphasis on the variety of ways people can learn how to code (sentence 14).

G. Incorrect. While this sentence incorporates ideas about opportunities to learn coding skills in school (fourth paragraph), the larger claim presented in the passage is not about opportunities schools should offer in order to help students learn to code. The passage primarily focuses on the opportunities offered to people who take on the challenge of learning to code.

H. Incorrect. Although the passage discusses the opportunities that are available to some students to learn coding skills in school (sentences 15–16), this point is a supporting detail of the passage, not the main claim of the passage.

7. The question asks for the best revision of sentence 10 to provide a transition to the argument in the third paragraph.

A. Incorrect. Some readers may choose this option because the second paragraph does discuss the complexities of coding; however, it does not discuss the difficulties of learning coding. The third paragraph demonstrates some of the complex ways coding is used in specific fields but does not illustrate how difficult learning coding may be.

B. **CORRECT.** This sentence provides the best revision of the transition sentence. The second paragraph ends with "the possibilities for applying them are infinite" (sentence 9), which supports the idea that people in "many occupational fields" (sentence 10) can benefit from having coding skills. The third paragraph illustrates this idea by providing specific examples of occupations that benefit from coding (stock market traders and doctors).

C. Incorrect. While sentence 13 suggests that employers recognize the value of coding skills, sentences 11 and 12 give examples of different industries that employ people who know how to code. The transition sentence should introduce the idea that coding skills are valuable to potential employees.

D. Incorrect. Some readers may choose this option because the second paragraph provides a brief definition of coding—"A coding language uses letters, numbers, and symbols that are arranged in a way that makes sense to a computer" (sentence 6)—which shows how this element of programming works, but the second paragraph does not specifically discuss what makes the field of computer programming unique. The third paragraph discusses how coding can be used in a variety of occupational fields (sentence 10).

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8. The question asks which sentence would best follow sentence 13 and support the ideas in the third paragraph.

E. Incorrect. While this sentence provides an example of a high salary, which is mentioned in the paragraph (sentence 13), the reference to "Experienced programmers, software engineers, and system administrators at large companies" focuses on specific occupations that may use coding, as opposed to the range of diverse occupations discussed in the third paragraph.

F. Incorrect. While sentence 12 does mention coding skills in the medical field as an example, the information provided in this answer supports only that idea and not the other ideas expressed in the third paragraph.

G. Incorrect. This sentence generally discusses employers looking for two things: "experience in a specific industry" and "knowledge of basic coding." The third paragraph, however, discusses the possibilities of using coding skills in a variety of occupations. The words "experience in a specific industry" do not connect to the idea the paragraph develops.

H. **CORRECT.** This sentence provides specific evidence of the job market favoring potential employees who have coding ability. It supports what is stated in sentence 13, that "jobs that require coding skills are typically higher paying."

9. The question asks which concluding sentence would best follow sentence 20 and support the argument presented in the passage.

A. Incorrect. While the passage does state that "jobs that require coding skills are typically higher paying" (sentence 13), it does not say or imply that coding skills are needed for most high-paying jobs.

B. **CORRECT.** The sentence successfully summarizes the main argument of the passage, which is that coding is involved in all electronic interaction (sentence 1) and is a useful skill to master, especially in many occupational fields (sentence 10).

C. Incorrect. In the fourth paragraph, the passage does promote students taking advantage of opportunities to learn coding; however, this information is a supporting detail and would not serve as a strong conclusion to the argument presented in the passage.

D. Incorrect. Some readers may choose this sentence because the fourth paragraph discusses how "some students may become interested in learning how to create programs, such as games and apps" (sentence 18), but this detail is only one part of the overall argument in the passage.

READING COMPREHENSION

The Best Laid Plans of Ravens

10. The question asks how paragraph 1 introduces the ideas that ravens may perceive time and plan for the future.

E. Incorrect. In the poem referenced in paragraph 1, the narrator does not consider whether a raven can see the future but believes it is actually happening. Additionally, the discussion in paragraph 1 is about how people have historically doubted animals' ability to plan, not about why people have doubted this ability in ravens specifically.

F. **CORRECT.** Edgar Allan Poe's poem features a raven that speaks in a prophetic way. Since prophecies are a prediction of the future, the statement suggests that the raven has a sense of time. This reference is then tied to a modern study where "researchers argue that ravens may be able to think ahead and even plan for the future" (paragraph 1).

G. Incorrect. Although the idea of a raven being aware of the future in the poem is tied to a study that "hints that one particular idea behind the poem might not be as far-fetched as it seems" (paragraph 1), this connection does not prove that the poem is what prompted scientists to conduct such a study.

H. Incorrect. Paragraph 1 introduces the idea "that ravens may be able to think ahead and even plan for the future" but does not explain in detail the importance of differentiating between whether ravens act on instinct or have the ability to plan.

11. The question asks which sentence from paragraph 4 supports the argument presented in the sentence from paragraph 1.

A. Incorrect. This sentence from paragraph 4 refers to the ravens' ability to adapt and learn but not to plan and think ahead.

B. Incorrect. This sentence from paragraph 4 relates the actions of the researcher rather than the actions of the ravens and does not provide evidence in support of the argument that ravens have the ability to think and plan ahead.

C. Incorrect. This sentence from paragraph 4 does not describe a behavior of the ravens that would support the argument in the sentence from paragraph 1; instead it relates the actions of the researchers without giving any information about the ravens' responses.

D. **CORRECT.** This sentence from paragraph 4 shows that the ravens seem to make a decision, which involves a thought process. The ravens chose to wait for the researcher rather than take the treats, suggesting that the ravens understood that the researcher would trade a larger treat for the bottle cap.

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12. The question asks which statement describes the effect in the passage of the phrase "merely instinctual" from paragraph 2.

E. Incorrect. The passage does not question animals' ability to find and save food but rather whether this or other behavior involves thought and planning for the future.

F. Incorrect. While the sentence states that "many animals hoard food," the passage does not suggest that they give priority of thought to this activity; they hoard food out of instinct.

G. Incorrect. Although the passage discusses animals' tendency to store a great deal of food, it does not suggest that their hoarding goes beyond their needs.

H. **CORRECT.** The passage suggests that in order for an animal's actions to qualify as planning for the future, "the animal must use specific decision-making skills to solve a problem" (paragraph 2). The behavior of hoarding food is based on instinct and done automatically without real thought.

13. The question asks which of the ravens' behaviors in the first experiment described in paragraph 4 most strongly supports the claim that the birds are capable of planning.

A. Incorrect. While "the researchers showed the birds how to use a small stone to open a box and get treats" (paragraph 4), the acceptance of the treats does not demonstrate planning.

B. **CORRECT.** Once the ravens learned which stone would open the box, they consistently selected only that stone.

C. Incorrect. Although the birds learned which stone opened the box, this behavior demonstrates not their ability to plan but rather their intelligence.

D. Incorrect. The birds' patience shows their anticipation for and understanding of the future gain of a treat but does not provide the strongest evidence of their ability to plan.

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14. The question asks how the sentence from paragraph 4 fits into the overall structure of the passage and contributes to the development of ideas.

E. **CORRECT.** The patience the ravens demonstrated in the sentence from paragraph 4 while waiting for the return of the researcher in both experiments shows their understanding that the researcher's return holds a benefit for them.

F. Incorrect. The passage does not state that there was a set timeline for the researcher's return; the seventeen hours, mentioned in the sentence from paragraph 4, was just the longest time measured.

G. Incorrect. The experiment did involve the ravens solving a problem. The ravens' patience demonstrated an understanding that there would be future gain for them by waiting for the researcher, but the sentence from paragraph 4 does not demonstrate the ravens' ability to plan.

H. Incorrect. The way the ravens obtained the food from the researcher required far more than instinct; in order to get the maximum amount of food, a number of learned skills, such as selecting a stone that would open the box and choosing the bottle cap over the immediate treat, were necessary. The ravens' ability to wait, as demonstrated in the sentence from paragraph 4, does not influence or affect a learned behavior or a possible instinct to hoard food.

15. The question asks how paragraph 5 fits into the overall structure of the passage and contributes to the development of ideas.

A. Incorrect. While paragraph 5 states that "more evidence needs to be gathered before scientists can fully conclude that ravens can plan for the future," this statement suggests that more research is needed, not that the results of the Lund University study are problematic.

B. Incorrect. Paragraph 5 does not discuss steps of the study or emphasize difficulties in determining whether the behaviors shown in the study were planned or practiced; instead it simply suggests that more study is required to make such a determination.

C. **CORRECT.** Paragraph 5 notes that some doubt remains ("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") and that more experimentation is needed; the author concludes that there is reason to believe the originally stated theory that ravens are quite smart and can give thought to how future events may affect them.

D. Incorrect. Paragraph 5 does not list the effects of the study or criticize the experiment for not differentiating between planning and instinct. The paragraph explains why the results of the experiments are not conclusive and emphasizes that more research is needed.

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16. The question asks how the author conveys a point of view on the study of animal intelligence.

E. **CORRECT.** Paragraphs 3 and 4 focus on the process and details of the experiments that scientists conducted. This detailed information from the author provides a sense of how the ravens demonstrated planning abilities beyond natural instinct. The author supports the claims from the experiments, calling the findings "exciting" and stating in the conclusion that "these experiments show that ravens could be much smarter than first believed" (paragraph 5).

F. Incorrect. Although two experiments are described in the passage, the description presents the experiments as building on each other and does not compare their results. The passage states that "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" (paragraph 5).

G. Incorrect. The author presents information from the experiments and the results that were gathered from them; while there is an admission that "more evidence needs to be gathered before scientists can fully conclude that ravens can plan for the future" (paragraph 5), the author does not criticize the experiments that are presented.

H. Incorrect. While the author does discuss some previously held beliefs about animal intelligence in paragraph 1, the focus of the passage is that experiments indicate that there is reason to question these beliefs, since "these experiments show that ravens could be much smarter than first believed"(paragraph 5). The previously held beliefs are not considered inaccurate by the discussion in the passage because only one example—the raven—is provided. The passage does not state that beliefs about animal intelligence as a whole are inaccurate.

17. The question asks the reader to choose the statement with which the author of the passage would most likely agree.

A. Incorrect. It is very likely that additional experiments or changes to the experiments presented can help scientists tell the difference between the types of behavior that the animals are showing. The current research supports "other recent advances in animal science" and also shows that ravens are "much smarter" (paragraph 5) than previously believed, making them excellent candidates for further research.

B. **CORRECT.** As paragraph 5 notes, "more evidence needs to be gathered before scientists can fully conclude that ravens can plan for the future." The evidence is not yet considered definitive because "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" (paragraph 5). Therefore, more research is needed in order to draw a complete conclusion as to whether or not the animals are demonstrating advanced intelligence or simply the results of training.

C. Incorrect. The passage shows that the scientists did not draw conclusions based on one experiment alone. The passage also states in paragraph 5 that additional research and experiments are necessary in order to obtain conclusive evidence of ravens' abilities to think and plan ahead.

D. Incorrect. The passage claims that more evidence must be gathered in order to make a claim that animals can definitely plan for the future. The evidence presented helps scientists "believe that ravens do actually think about their own future" (paragraph 5), but more confirmation is needed. The passage does not discuss performing experiments on additional species.

Excerpt from *Winter Wheat*

18. The question asks how the sentences in paragraph 2 help develop a theme of the excerpt.

E. Incorrect. Although the sentences from paragraph 2 describe Ellen's "funny feeling" upon realizing that she will no longer be home when the beans that her mother is making are ready to eat, the details do not show that life presents many challenges. Additionally, the theme that life presents people with many challenges is not a theme found in the excerpt.

F. Incorrect. The sentences from paragraph 2 state that Ellen has "a funny feeling" while awaiting a major life event, but they do not indicate that she is confused or stressed. The details in the sentences convey a sense of wistfulness, but the theme that the stress of major life events causes confusion is not found in the excerpt.

G. **CORRECT.** The sentences from paragraph 2 show that Ellen's mother has moved on from the familiar and left her childhood home behind, just as Ellen is about to do. This information links the experiences of parent and child and helps develop the theme that moving beyond the familiar is a common human experience.

H. Incorrect. Although the sentences from paragraph 2 show that Ellen's mother has learned to cook New England food very well ("as though she were a New Englander herself"), they do not provide information about how easy or difficult it was for Ellen's mother to learn a new way of cooking. The theme that people can easily learn the routines of a new culture is not a theme found in the excerpt.

19. The question asks how the sentence from paragraph 3 contributes to the conflict in the excerpt.

A. Incorrect. Although Ellen's father does want to drive to the city, this sentence does not reveal his reasons for wanting to do so. Ellen's father's wish to drive to the city is important to the conflict of the excerpt not because of his underlying reasons but because his wish differs from Ellen's mother's wish to take Ellen to the train at Gotham—a difference of opinion that introduces tension between the parents.

B. **CORRECT.** The sentence causes Ellen's parents to propose competing options for taking her to the train, and the resulting conversation recalls fraught memories of an earlier leave-taking in the family. The disagreement between Ellen's mother and father over where to take Ellen to catch the train heightens the tension between them. Because the primary conflict of the excerpt is Ellen's anxiety about the effect her leaving will have on the relationship between her parents, this remark contributes to the conflict by bringing her parents' disagreement into view.

C. Incorrect. Although Ellen will put physical distance between herself and her parents on the following day, the remark she makes does not lead her to emotionally distance herself from her parents. Moreover, the emotional distance between Ellen and her parents is not the primary source of conflict in the excerpt.

D. Incorrect. While paragraph 1 states that Ellen's mother "seems to think of nothing farther away than today or perhaps yesterday or tomorrow morning," the sentence in paragraph 3 does not show any reluctance to plan far in advance. Moreover, planning for the future is not a source of conflict in the excerpt.

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20. The question asks how the phrase "looked straight at it" in paragraph 9 contributes to the meaning of the excerpt.

E. **CORRECT.** The phrase shows Ellen deciding to directly confront the memory even though she initially wanted to ignore it ("I couldn't keep from thinking of that time Dad went back East. I tried to" [paragraph 9]). Though the memory is emotionally fraught for Ellen, the phrase "looked straight at it" shows that she is willing to face problems—such as a painful family memory—head on.

F. Incorrect. The phrase in paragraph 9 does not show Ellen studying all parts of an issue but rather forcing herself to focus on something she would have preferred not to think about.

G. Incorrect. In looking "straight at" the memory, Ellen is not considering both sides of an argument. Instead, she is making herself think about an uncomfortable memory that she had been trying to avoid revisiting. The phrase indicates that she is finally willing to directly confront an unsettling recollection.

H. Incorrect. Given the detail in paragraph 9 that Ellen initially attempted to keep from thinking about her father's trip to Vermont, the phrase "looked straight at it" indicates a willingness, but not an eagerness, to seek wisdom from reflecting on past experiences.

21. The question asks how the words "cold" and "dark" affect the tone in paragraph 10.

A. Incorrect. The mood of paragraph 10 is primarily one of sadness as Ellen says goodbye to her father at the train station. The words "cold" and "dark" do not convey unpredictability but rather emphasize Ellen's feeling of loss over the departure of her father.

B. Incorrect. Although the father's departure causes tension with his wife (" 'I'll manage,' Mom snapped back" [paragraph 11]), Ellen does not display anger or resentment toward her parents.

C. Incorrect. Although Ellen's father states that he wishes his family could come with him on the trip to Vermont (" 'I wish you could go, Anna,' Dad said to Mom, 'and we could take Ellen' " [paragraph 12]), the words "cold" and "dark" describe Ellen's perspective on her father's departure. They create a tone of sadness from Ellen at being left behind rather than a tone of regret from her father because he has to leave.

D. **CORRECT.** In paragraph 10, Ellen states, "I could feel how cold and dark it was." The words "cold" and "dark" highlight her emotional response to the departure of her father, emphasizing the almost physical sense of grief she feels at being separated from someone so precious to her.

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22. The question asks which sentence from the excerpt provides evidence that Ellen has a lot in common with her father.

E. **CORRECT.** This sentence from paragraph 1 shows that Ellen and her father both get excited about the coming of spring and share an interest in reading magazine serials (stories published in serial installments). The sentence implies that Ellen and her father have shared likes and interests, and therefore, it provides clear evidence that they have a lot in common.

F. Incorrect. While this sentence from paragraph 4 highlights the warm relationship between Ellen and her father and shows that he would like to take her to the train station in town, it does not provide clear evidence that they share a lot in common.

G. Incorrect. Although this sentence from paragraph 6 implies that Ellen understands her father well enough to intuit his preference to go to the train station in town ("but I knew he wanted to go into Clark City"), their closeness is not clear evidence that Ellen and her father have a lot in common.

H. Incorrect. While this sentence from paragraph 25 shows Ellen's concern about the effect that her leaving the farm will have on her parents, it does not provide clear evidence that Ellen and her father have a lot in common.

23. The question asks how the sentences from paragraph 1 and paragraph 19 help develop a central idea of the excerpt.

A. **CORRECT.** The sentences illustrate a practical aspect of Ellen's mother's personality and show that she is concerned with an immediate task that needs to be completed. The details in these sentences help develop the central idea that practical people focus on current needs—such as preparing food for the following day—rather than worrying about the future.

B. Incorrect. These sentences do not show Ellen's mother focusing on her daughter's needs before her own, and the idea that parents consider their own needs only after considering those of their children is not a central idea of the excerpt.

C. Incorrect. Although the sentence from paragraph 19 shows Ellen's mother planning a few hours ahead by preparing the next morning's breakfast, the idea that it is sometimes important to plan ahead is not a central idea of the excerpt, nor is it supported by the sentence from paragraph 1.

D. Incorrect. The details in the sentences do not show that it is a waste of time to dream about the future. The sentences highlight the tendency of Ellen's mother to focus her attention on the practical necessities of the moment, but the idea that dreaming about the future is a waste of time is not a central idea of the excerpt.

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24. The question asks how the flashback in paragraphs 10–24 affects the plot of the excerpt.

E. Incorrect. The flashback does not show that Ellen and her mother faced extra work as a result of the father's trip to Vermont. Although paragraph 19 describes Ellen's mother making oatmeal for the next day's breakfast, this task was not extra work.

F. Incorrect. Although the flashback highlights Ellen's fondness for each of her parents, it describes her father's initial departure only and does not show what happened to the familial bond while he is away.

G. Incorrect. Although Ellen describes the memory of her father's departure as something she wanted to avoid thinking about, she does not fear that it will be too difficult to leave her parents. Instead, she is concerned about what will happen to her parents' relationship when she is no longer there.

H. **CORRECT.** The flashback illustrates the close connection that Ellen has with her parents by describing her sadness over the departure of her father ("My throat ached all the way" [paragraph 15]) and presenting a moment of comfort and reassurance between Ellen and her mother ("She laid her hand against my face and it felt rough and hard but firm" [paragraph 20]).

25. The question asks which sentence from the excerpt provides evidence that Mom wants Ellen to understand the family's heritage.

A. Incorrect. Although this sentence from paragraph 2 describes a domestic moment that takes place within the family home, it does not relate to the heritage of either parent and therefore does not provide evidence that her mother wants Ellen to understand the family's heritage.

B. Incorrect. Although this sentence from paragraph 5 provides the name of the train station closest to Ellen's family's farm, the train stop at Gotham is not related to the family's heritage. Therefore, this sentence does not provide clear evidence that her mother wants Ellen to understand the family's heritage.

C. Incorrect. Although this sentence from paragraph 7 describes an aspect of the family dynamic (Ellen predicts that while browsing in stores in town, "Dad [would go] one way and Mom and I another"), their shopping habits do not provide clear evidence that her mother wants Ellen to understand the family's heritage.

D. **CORRECT.** In this sentence from paragraph 22, Ellen's mother addresses her by the Russian version of her name (Yeléna) and repeats her own Russian name (Anna Petrovna). The choice to call her daughter Yeléna instead of Ellen follows immediately after Ellen asks, "Mom, was that really your name—what Dad called you?" (paragraph 21), and the mother's surprised response provides evidence that she both wants and expects Ellen to understand the family's Russian heritage.

Massachusetts: Lowell National Historical Park

26. The question asks why the author includes the quotation from the Scottish traveler in paragraph 1 of the passage.

E. Incorrect. While it is likely that people outside the United States recognized that both the natural landscape and the bustling industry were significant, the quotation from the Scottish traveler is meant to convey the variety of the types of attractions in the U.S., not to make a general statement about their contribution.

F. Incorrect. The Scottish traveler mentions both "American scenery" and "American industry" in the quotation, but the intent is to highlight that they are each points of interest. The quotation does not provide a comparison of the two attractions.

G. **CORRECT.** The quotation emphasizes the idea that the United States offers different attractions. The Scottish traveler highlights the two places in the United States that he will most remember: first, the beautiful natural formation of Niagara Falls (" 'the glory of American scenery' ") and second, the industrial city of Lowell (" 'the glory . . . of American industry' ").

H. Incorrect. The Scottish traveler mentions both "American scenery" and "American industry" in the quotation but does not imply that the natural resources contributed to the development of industry.

27. The question asks which description conveys the central idea that Lowell was "one of America's most significant industrial cities" (paragraph 1).

A. Incorrect. While the passage does state that the city's canals, mills, and boardinghouses were built by early immigrants from Ireland, these details do not contribute to the development of the overall idea that Lowell was a significant industrial city.

B. Incorrect. The details about the women and immigrants who worked in the mills is important to the passage, but these details alone do not show that Lowell was a significant industrial city.

C. **CORRECT.** The details throughout the passage about the development of the mills and the people who worked in them convey the significance of Lowell in early American industry. Paragraph 2 shares details about the businesses that started in the early 1800s and contributed to the development of industry in the region ("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"). Then paragraphs 3–6 provide specific details about the people who worked in the mills at different points in time.

D. Incorrect. Although the passage references Lowell's culturally diverse community ("Young Yankee women, immigrant families, and European tourists all flocked to Lowell to find work at one of the many textile mills" [paragraph 1]), these groups alone are not what marked Lowell as a significant industrial city.

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28. The question asks for the sentence in paragraph 2 that best supports the idea that Lowell became "a bustling industrial city" (paragraph 1) in a short period of time.

E. Incorrect. While the sentence provides details on when the town of Lowell was founded and the natural features of the area, it does not support the idea that the city became "a bustling industrial city" in a short period of time.

F. Incorrect. Although this sentence indicates that the mill buildings were a noticeable feature of the city and provides details on how the mills worked, it does not specifically show that Lowell had become "a bustling industrial city" in a short period of time.

G. Incorrect. While this sentence lists some recognizable mill buildings along the river and notes when their associated businesses were established, it does not support the idea that Lowell had become "a bustling industrial city" in a short period of time.

H. **CORRECT.** This sentence indicates that within only a few decades of the city's founding, it experienced massive industrial growth, with "40 textile mills employing over 10,000 workers," supporting the idea that Lowell became "a bustling industrial city" in a short period of time.

29. The question asks which statement best describes how the sentence in paragraph 3 fits into the overall structure of the passage.

A. **CORRECT.** The sentence in paragraph 3 provides a transition from the overall description of the city and the mills to a description of the women who made up the workforce in the mills. The idea that women left domestic life in favor of working in the mills is important in the passage, and the sentence serves to connect that idea to the previous discussion about the mills.

B. Incorrect. While the mill girls' dissatisfaction with their working conditions is addressed later in the passage ("These wage cuts, deteriorating working conditions, and long workdays led the 'mill girls' to protest and organize strikes" [paragraph 4]), the sentence in paragraph 3 does not indicate a shift in tone from positive to negative. The sentence provides a transition to the discussion of the women who worked in the mills.

C. Incorrect. Although the sentence in paragraph 3 mentions that women became interested in working in the mills because of the "constricted lifestyle of small rural towns," structurally the sentence does not function as a summary because, instead of expanding on the idea of the difficulties or challenges of life in small rural towns and rural areas, the paragraph goes on to describe the advantages and disadvantages of life in the city for these women.

D. Incorrect. The sentence in paragraph 3 focuses on the choices women made to leave rural towns to work in the city in the early to mid-1800s, not the mid-1800s to the late 1800s. The sentence does not create a comparison between the workforce in the mid-1800s and that in the late 1800s.

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30. The question asks how the sentence in paragraph 5 contributes to the development of ideas in the passage.

E. Incorrect. The sentence from paragraph 5 does not imply that Lowell was founded by early Irish immigrants. The sentence explains how Irish immigrants had been settling in Lowell since the city was established and that they contributed to the construction of the city, which allowed it to become an industrial center several decades later.

F. **CORRECT.** The sentence from paragraph 5 shows that early Irish immigrants were critical to the success of Lowell as an industrial city. This information supports the development of the idea that the work of Irish immigrants and immigrants from other places is an important element in the historical significance of industry in Lowell.

G. Incorrect. The sentence from paragraph 5 does not suggest that new Irish immigrants were readily accepted into the community. Paragraph 5 states that "initially, Lowell's Protestant community was slow to welcome Irish immigrants, but the hostility between Yankee Protestants and Irish Catholics eventually disappeared."

H. Incorrect. The sentence from paragraph 5 does not highlight the relationship between the mill girls and the new Irish immigrants. Paragraph 4 explains how the mill girls left Lowell, and paragraph 5 states that the mill girls were replaced by "predominantly Irish Catholics, who traveled to America during the Great Potato Famine" but does not discuss a relationship between them.

31. The question asks for the sentence that best summarizes the mill girls' time as the dominant workforce in Lowell.

A. Incorrect. While the passage explains that mill girls were initially eager to leave the domestic duties of life in rural areas, the summary sentence does not address the details about the mill girls' time working in the mills or the changes that led the mill girls to leave the industry.

B. Incorrect. Mill girls initially found satisfaction in the mill work and lifestyle, and when they did leave, immigrants filled the empty jobs. This summary sentence, however, does not address the details about the mill girls' time as the primary workforce in Lowell or the circumstances that led them to leave their jobs in the mid-1800s.

C. Incorrect. Mill girls did leave home to work in the Lowell mills, and they did grow dissatisfied over time, but this summary sentence does not include details about the mill girls' actions to improve the working conditions.

D. **CORRECT.** This sentence summary best captures the mill girls' experience as outlined in paragraphs 3 and 4. The sentence concisely summarizes both the women's initial excitement about the opportunity to live independently ("Women found that Lowell's mills offered monthly wages for their services and provided them room and board" [paragraph 3]) and their eventual inability to secure better working conditions ("When their demands went unheard, the women left Lowell, and immigrant groups replaced them in the workforce" [paragraph 4]).

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32. The question asks for the reason that best illustrates why Lowell lost its status as an industrial leader.

E. Incorrect. While the passage discusses the "long work hours, low wages, and poor living conditions in the city's crowded tenements" (paragraph 6) in Lowell, these details highlight the living and working conditions of immigrant groups. The author does not state that poor living and working conditions are the reason Lowell lost its status as a "model of industry."

F. Incorrect. Paragraph 5 in the passage acknowledges that there was some tension between the different ethnic and religious groups in Lowell, but this idea is not what led to Lowell's decline as a "model of industry."

G. **CORRECT.** When Lowell was initially established, the mills in the city thrived because of their advanced manufacturing methods ("gaining global recognition for its state-of-the-art technology, innovative canal and dam system, [and] mill architecture" [paragraph 1]). However, manufacturing technology changed and improved over time, and many mill owners chose to close the mills rather than modernize them, resulting in Lowell's loss of status as a "model of industry" ("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" [paragraph 6]).

H. Incorrect. The details about the temporary revival of the mills during World War II do not show why Lowell is no longer considered a "model of industry." The mills were used briefly during wartime because of an increased need for supplies, but this use of the mills was short-lived.

Ode to Fireworks

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

A. **CORRECT.** In lines 8–9 the speaker compares the deep thumping noises at the start of a fireworks show to the muffled thumping sound made when beating a rug to clean it. The imagery of "low, dull *thwumps*" (line 8) (onomatopoeia) describes a sound that is not clear or powerful. To the speaker, these low, distant explosions are the signal that the fireworks display is starting and that the loud, cracking sound of fireworks will be heard soon ("Then we counted the seconds between the lightning / and thunder" [lines 10–11]).

B. Incorrect. The comparison in lines 8–9 deals with the low sound of the first fireworks shooting off rather than the streaks of light they emit. To the speaker, the low *thwumps* (onomatopoeia) are the signal that fireworks are about to explode overhead, much like the way a streak of lightning during a storm indicates that a crash of thunder will follow in a few seconds.

C. Incorrect. The *thwump* (onomatopoeia) sounds are the start of the fireworks show, not thunder. As a comparison, the speaker says the initial *thwumps* of the fireworks signal anticipation for the full explosion that will come, much like the way the speaker would watch for lightning and count the seconds before an impending thunderclap (lines 10–11).

D. Incorrect. The muffled *thwump* (onomatopoeia) sounds occur before the dazzling explosion of lights and before sparks start to fall from the sky. The comparison focuses on the sounds of the experience, not the sight of the experience.

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34. The question asks what the word choice in lines 22–23 of the poem conveys about the speaker.

E. Incorrect. The word "jewels" is used figuratively to indicate the sentimental value that the experience of watching the fireworks holds for the speaker. There is no indication in the poem that the speaker values material possessions.

F. Incorrect. The use of the word "jewels" highlights the importance of the memory in the speaker's mind. The imagery in the words "written upon" expresses the way the bright streaks of light curve and fly across the night sky, not that the speaker views the fireworks display as magical.

G. Incorrect. The speaker describes the elements of the fireworks display that stand out most clearly. The view of the bright, colorful fireworks streaking across the sky is distinct, but it is not unique to the country setting.

H. **CORRECT.** The word "jewels" creates a picture of watching shining and sparkling explosions in the night sky and suggests that this experience holds sentimental and emotional value for the speaker. The speaker cherishes the memory of the experience.

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

A. Incorrect. The purpose of italicizing the word "*night*" is not to convey mystery. While the speaker refers to not knowing the exact location where the firework viewing took place ("in the stubble of what had been / somebody's cornfield" [lines 25–26]), the emphasis on "*night*" is meant to highlight the darkness and contrast the bright light from the fireworks soaring across the sky.

B. **CORRECT.** The italics are intended to place emphasis on one key aspect of nighttime—total darkness. The speaker is making a point that night in the country was truly dark, unlike the night the speaker currently experiences in a city, where light emitted from buildings and vehicles prevents complete darkness.

C. Incorrect. The tone in the second stanza is positive, showing admiration for the beauty visible in true darkness rather than fear: "But it was another thing to see / the sky at night written upon / with those jewels" (lines 21–23).

D. Incorrect. The speaker is talking about the general experience of watching fireworks on several occasions, not focusing on the events of a specific night. The use of italics on the word "*night*" emphasizes the speaker's memory of the persistent darkness.

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36. The question asks what the purpose is of the repeated words "rising and falling" in lines 26 and 37.

E. Incorrect. These lines do not provide insight into the speaker's interactions or feelings of solitude. The speaker mentions the emptiness of the country and the crowds in the city, but these repeated words are meant to draw a connection between the locations rather than show differences between them.

F. **CORRECT.** The first mention of these words occurs during a recollection of the speaker's past, and the second takes place during a description of the speaker's present. The speaker looks to the connections between the country setting ("All around us, crickets / stridulated in the stubble of what had been / somebody's cornfield, their song rising and falling" [lines 24–26]) and the city setting ("And the music around me is the music of people, / their voices rising and falling in a hundred languages" [lines 36–37]) as a source of comfort.

G. Incorrect. Even though the lines call out specific sounds, the purpose of the repetition of the words in the two parts of the poem is to show how the speaker connects the two settings. The "rising and falling" of the sounds is one detail the speaker highlights.

H. Incorrect. The repetition of the words "rising and falling" is used to compare the different locations in the speaker's life, not to compare fireworks to the sounds of crickets in the country or to the sounds of people moving and talking in the city.

37. The question asks what impact the phrase "Everything is a constant celebration" (line 33) has in the poem.

A. Incorrect. The speaker describes a sense of happiness and contentment in both the city and the country and does not indicate that one setting is more pleasurable than the other.

B. Incorrect. The word "celebration" has a positive association and does not imply that the speaker is overwhelmed in the city. Throughout the third stanza (lines 28–42), the speaker conveys appreciation for the elements of the city that make it different from the country ("And the music around me is the music of people, / their voices rising and falling in a hundred languages" [lines 36–37]).

C. **CORRECT.** From the speaker's perspective, the constant light ("awash in light" [line 32]) contributes to the speaker's feeling that, in the city, celebratory fireworks are ever present. In comparison, fireworks lit up the country sky only for celebratory occasions or annual events ("In autumn my mother drove us to the edge of the field / where the fair was set up year after year" [lines 1–2]).

D. Incorrect. While the speaker observes many things going on in the city at a given moment, the "constant celebration" in line 33 is intended to convey a comparison to the speaker's previous experience in the country rather than emphasize the hectic pace of life in the city. The continual light and sounds in the city remind the speaker of lights and sounds experienced only on occasion in the country.

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38. The question asks how the memory in lines 41–42 affects the speaker.

E. Incorrect. The speaker does not express concern in these lines about the impossibility of returning to childhood or the past. For the speaker, the past and the memories associated with it are a source of comfort and a way to remember simpler times ("I remember the feel of the pickup truck bumping / across the ridged field" [lines 40–41]).

F. Incorrect. While the speaker recalls anticipation before the start of a fireworks display, there is no hint that the speaker is impatient. Particularly in lines 41–42, the speaker is reminded of the expectation of hearing and seeing fireworks and the sense of simple contentment felt in the experience ("I find myself / craning my neck upward at odd moments" [lines 29–30]).

G. Incorrect. The speaker is reflecting on past experiences and pointing out the elements of the city that remind the speaker of these past experiences. The speaker acknowledges the differences between the country and city settings but does not convey regret for leaving the rural area ("This is where we live now, / and it is how we live now, awash in light / of every hue" [lines 31–33]).

H. **CORRECT.** The memory of watching the fireworks on the way home creates a sense of comfort that stays with the speaker ("escorted us home"). The speaker looks forward to moments when the youthful experience ("childhood bursts") of being excited by something like a fireworks display can be a source of happiness.

39. The question asks what the fireworks in the poem represent about the speaker.

A. Incorrect. While the speaker misses elements of the past, the speaker is also positive about the present, with comparisons to a "constant celebration" (line 33) and descriptions of "the music of people" (line 36). The speaker does not indicate a desire to return to a simpler way of living.

B. **CORRECT.** The speaker misses the experience of watching the fireworks display with family and friends but understands that time has progressed and that life is now different. The lines "This was a treat we waited / all year for" (lines 6–7) highlight the significance of the memory of waiting for and watching the fireworks. In the speaker's present, the lines "I remember the feel of the pickup truck bumping / across the ridged field" (lines 40–41) emphasize the key details from the experience that stand out in the speaker's mind when something in the current environment reminds the speaker of the past.

C. Incorrect. While the speaker does share details about the present and the tone is generally positive, the fireworks do not suggest that the speaker has high expectations for how everyday life should be. The third stanza (lines 28–42) describes some of the speaker's imaginings about the aspects of going about one's daily life, but the speaker does not form expectations from these fantasies.

D. Incorrect. While the speaker does mention discussing cloud shapes with a family member in lines 19–20, the fireworks serve as a more general reminder of the speaker's past life. Viewing the bright lights of the city makes the speaker recall memories of the speaker's past and the feelings of anticipation before the fireworks show.

Excerpt from *In Search of the Unknown*

40. The question asks how paragraph 2 helps develop the plot.

E. Incorrect. As paragraph 1 indicates, writing such letters is one of the main parts of the narrator's job ("and I was always busy, part of the day, in dictating answers to correspondents"), and he shows no indication of disliking this work. The letters are to inform people whether the zoo will accept their animals.

F. Incorrect. Paragraph 2 indicates that the narrator offers his letters to the professor merely for official approval. At the start of the excerpt, the narrator is confident in his reply and does not anticipate that his response will differ from that of the professor, so he has no need to "predict what the professor would say."

G. **CORRECT.** The phrase "uncompromising refusals" in paragraph 2 indicates the confidence that the narrator initially has in his belief that the animals described in the letters are not of value to the society. This confidence is badly shaken as the plot unfolds, as when Professor Farrago states that " 'I am daring to believe that it *is* the great auk itself' " (paragraph 23). The narrator's transition from an attitude of dismissive doubt to one of budding hopefulness is a major part of the plot ("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" [paragraph 34]).

H. Incorrect. The narrator does not resent the professor's review of the letters; instead, the phrase "of course" in paragraph 2 shows that he expects to submit the letters to the professor as part of his job.

41. The question asks what the phrase "a faint trace of apology" in paragraph 3 conveys about the professor.

A. Incorrect. The fact that the narrator had intended to leave the office for the day is not the source of the professor's faintly apologetic manner, which is instead caused by the professor's understanding that their conversation about the letter and the expedition is likely to cause an argument ("with a whimsical smile that suggested amusement, impatience, annoyance" [paragraph 3]). In paragraph 29, the professor asks the narrator if he can leave on an expedition that same evening, which indicates that the professor does not feel bad about taking up the narrator's time after work.

B. Incorrect. The paragraphs that follow the sentence from paragraph 3 show the professor sharing his opinions without pause, even when his opinion of the narrator is unflattering (" 'Like swimming squirrels, you navigate with the help of Heaven and a stiff breeze, but you never land where you hope to—do you?' " [paragraph 17]).

C. Incorrect. The professor knows that the narrator will push back regarding the letter, but the professor is not uncomfortable challenging the narrator. Professor Farrago seems perfectly at ease and comfortable as he begins the discussion with the narrator.

D. **CORRECT.** The professor is both amused and annoyed by the narrator's dismissal of the possibility that great auks still exist, and the professor knows that the narrator is likely to react negatively to being sent on what the narrator considers a "fool's errand" (paragraph 25).

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42. The question asks how the exchange between the professor and the narrator in paragraphs 8–11 contributes to the development of the characters.

E. **CORRECT.** Paragraphs 8–11 help develop the characters by revealing the difference between the opinions of the narrator and the professor. The narrator believes without any doubts that Halyard, the man who wrote the letter about the auks, is either " 'a liar or a fool' " (paragraph 9), while the professor believes in the possibility that the writer of the letter could actually be telling the truth ("I said as much to Professor Farrago, but, to my surprise, he appeared to waver." [paragraph 8]).

F. Incorrect. In paragraph 8, the narrator reacts to the letter writer with "a contemptuous tolerance," and he is shocked to learn that the professor actually agrees with the man (paragraph 11) whom the narrator has bluntly condemned as a liar or a fool (" 'In my opinion,' said I, 'he's one or the other.' " [paragraph 10]). The exchange presents an emphatic disagreement between the narrator and the professor, and it does not show them working together in a collaborative manner.

G. Incorrect. Although the narrator initially distrusts the contents of the letter and shows "contemptuous tolerance for the writer" (paragraph 8), the excerpt portrays the professor as experienced and intelligent, not as one who is easily deceived.

H. Incorrect. While the narrator does begin to consider the professor's perspective at the end of the excerpt, paragraphs 8–11 primarily serve to establish the difference of opinion between the narrator and the professor about the writer of the letter.

43. The question asks how the professor's observations in paragraphs 15–17 create tension in the excerpt.

A. **CORRECT.** The professor criticizes " 'you young fellows' " (paragraph 15), suggesting that the ideas of young scientists like the narrator are unsupported (" 'like swimming squirrels,' " [paragraph 17]) and inaccurate (" 'but you never land where you hope to—do you?' " [paragraph 17]; " 'you embark on a theory for destinations that don't exist' " [paragraph 15]). The narrator then becomes "red in the face" (paragraph 18), indicating that the narrator is upset by the professor's criticism, and asks the professor about the great auk in an attempt to defend himself.

B. Incorrect. While the narrator does experience a negative reaction to the professor's words, the professor is being genuine, not sarcastic. In fact, the sarcasm comes from the narrator in paragraph 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' "), not from the professor.

C. Incorrect. The professor's observations cause the narrator to blush with embarrassment ("rather red in the face" [paragraph 18]), but the narrator understands the point that the professor is making about the narrator's acceptance of the idea that great auks do not exist. The narrator recognizes that the professor is criticizing his youthful ideas, not his opinion.

D. Incorrect. The professor shows amusement with the narrator's perspective. The narrator is embarrassed and upset by the professor's words, but the narrator does not display frustration with the professor's lack of interest in a commonly held view of the existence of a certain species of bird.

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44. The question asks how the interaction between the narrator and the professor in paragraphs 26–28 contributes to the development of the theme.

E. Incorrect. Paragraphs 26–28 do not show the narrator arguing against making the expedition. He instead argues that it is unnecessary for the professor to pay to send extra men on the expedition. The narrator points out that he can ask for assistance if he does, in fact, find great auks (" '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' " [paragraph 28]).

F. Incorrect. When the professor criticizes the narrator's blind acceptance of the theory about the existence of the auks, the narrator is frustrated and embarrassed. This frustration does not stem from his inability to make decisions for the zoological society.

G. Incorrect. The professor states that " 'what I want you to do is to get those birds here safely' " (paragraph 27), which indicates that his main priority is the birds' safety rather than acquiring specimens regardless of the consequences (i.e., at any cost).

H. **CORRECT.** Paragraph 26 describes the professor and the narrator making practical plans for the expedition ("we made out a list of articles necessary for me and itemized the expenses I might incur"), indicating the narrator's acceptance of his assignment while also revealing that he does not anticipate a "successful termination to the expedition." Paragraph 28 further describes the personal objections of the narrator, who believes that adding extra men to the expedition is pointless (" 'a useless expense' "), since he does not expect to find any great auks to bring back.

45. The question asks which sentence from the excerpt best explains why the professor is eager to send the narrator on an expedition.

A. Incorrect. In the sentence from paragraph 25, the narrator suspects the professor is losing his ability to reason because his request (to secure the great auk for the society) seems impossible. The professor is excited about the discovery, but the narrator doubts whether the discovery is real. The sentence does not explain why the professor is excited, however.

B. Incorrect. Paragraph 26 shows the professor and the narrator planning the logistics of the trip, but it does not explain why the professor is eager to send the narrator on the expedition.

C. Incorrect. Although the sentence from paragraph 27 expresses the professor's interest in having the narrator bring the birds back safely, it does not show the underlying reason why the safety of the birds is so crucial, which is that the great auk is extremely rare.

D. **CORRECT.** The sentence from paragraph 33 reveals the professor's excitement to get " 'the rarest of living creatures,' " the great auk. In paragraph 14, the narrator states that "it is generally accepted . . . that the great auk has been extinct for years," which would make a living auk incredibly rare and explains the professor's eagerness for the narrator to go on the expedition.

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46. The question asks how paragraph 34 helps develop the plot of the excerpt.

E. **CORRECT.** Despite his initial disbelief, the narrator admits in paragraph 34 that he is starting to feel the "same strange hope" the professor feels, which is to find the great auks (paragraph 33).

F. Incorrect. While the narrator does make an effort in paragraphs 11–22 to understand the professor's thinking, paragraph 34 reveals that the narrator has been affected by the professor's "strange hope" for the auks and is beginning to share this hope "in spite of" himself.

G. Incorrect. The narrator describes a feeling of hope in paragraph 34 that would not be present if he had simply been overruled by the professor and did not share any of the professor's belief in the possibility that the auks exist. In addition, it was established before paragraph 34 that the narrator was willing to be overruled ("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" [paragraph 25]).

H. Incorrect. The narrator does not express a sense of urgency in paragraph 34 to complete the expedition. Instead, he expresses hope that the great auks might really exist.

47. The question asks which sentence best demonstrates the professional relationship between the narrator and the professor.

A. Incorrect. Although the professor's handing of the paper to the narrator indicates that they are beginning to discuss the letter about the great auk, the sentence from paragraph 4 does not convey the relationship between a subordinate employee (the narrator) and a superior (the professor).

B. Incorrect. The sentence from paragraph 24 presents the narrator's immediate internal reaction to the professor's words. The sentence emphasizes that the professor's belief in the great auk's existence is so outrageous that the narrator initially thinks the professor is starting to lose touch with reality. This is a momentary reaction to the professor's words, not a demonstration of the professional relationship between the two.

C. **CORRECT.** The sentence from paragraph 25 reveals that while the narrator disagrees with the professor ("this fool's errand was none of my conceiving"), he obeys because he works for the professor ("there was nothing to do but to obey").

D. Incorrect. The professor's good-humored offer of assistance in the sentence from paragraph 29 does not best demonstrate the underlying employer-employee relationship between the professor and the narrator. The narrator has to go on the expedition because the professor, his boss, told him to.

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48. The question asks how the author develops the contrast between the narrator's point of view and the professor's point of view.

E. Incorrect. The excerpt does not describe the narrator's thoughts about how age and experience influence the professor's reasoning in enough detail to fully contrast them against the thoughts about the narrator that the professor expresses in paragraphs 15–17. The narrator's idea that the professor might be "on the verge of dotage" (paragraph 24) is meant in a humorous way.

F. **CORRECT.** The primary conflict of the excerpt revolves around the narrator's disagreement with the professor about whether the letter about the great auks could be true. As the two men converse, their contrasting attitudes toward the letter become clear: the narrator dismisses the possibility of great auks out of hand (" 'of course the man is mistaken' " [paragraph 5]; " 'here is a man . . . who wants you to send somebody to take charge of a bird that doesn't exist!' " [paragraph 12]), while the professor calmly admits that although " 'nine hundred and ninety-nine men in a thousand would throw that letter aside and condemn the writer' " (paragraph 9), he himself believes that the writer could be telling the truth (" 'How do you know,' asked Professor Farrago, 'that the bird in question does not exist?' " [paragraph 13]).

G. Incorrect. The professor explains why he disagrees with the narrator (paragraphs 19–21), but he does not make persistent efforts to convince the narrator to change his mind about the letter. Instead he states that the narrator will go on an expedition to retrieve " 'whatever it is that our correspondent has' " (paragraph 23), thereby requiring the narrator to go collect the great auks whether the narrator believes in them or not.

H. Incorrect. The point of the dialogue is not to explain the subordinate-supervisor relationship between the narrator and the professor but rather to contrast what each character believes about the contents of the letter.

Excerpt from "Research Riddle Resolved"

49. The question asks how the sentence from paragraph 2 contributes to the overall structure of the excerpt.

A. Incorrect. While the sentence from paragraph 2 does mention the platypus's unique appearance, the remainder of the excerpt does not focus on the physiology of the platypus but instead focuses on the significance of scientists' platypus research and what it can "tell us about people" (paragraph 4).

B. Incorrect. Paragraph 1 discusses the platypus as the "duck-billed" animal that "still captures our imagination anew and irresistibly attracts the attention of science writers everywhere," but highlighting the idea that the platypus's unusual appearance has attracted scientists' attention is not how the sentence from paragraph 2 fits into the overall structure of the excerpt.

C. Incorrect. Paragraph 1 states that "the May 2008 *Nature* report detailing the DNA insides of the duckbilled platypus invited colorful tales from just about every mainstream media outlet," but it does not discuss current ideas in the field. Paragraph 2 focuses on the "scientific surprise" of the platypus.

D. **CORRECT.** The sentence from paragraph 2 serves as a transition from the introductory idea that "the animal still captures our imagination anew and irresistibly attracts the attention of science writers everywhere" (paragraph 1) to the central idea that the platypus has great scientific significance.

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50. The question asks what the phrase "evolutionary DNA tapestry" in paragraph 3 conveys about the platypus.

E. **CORRECT.** In the excerpt, the term "tapestry" conveys the sense of a rich history; the "platypus heritage" described in paragraph 3 is woven together with "threads" from mammals, birds, and reptiles in its genetic background.

F. Incorrect. While paragraph 3 does mention mammals and reptiles, it does not discuss when the platypus developed traits from those classifications. Rather, it refers in general to "hundreds of millions of years ago, when reptiles and mammals branched off the evolutionary tree."

G. Incorrect. The excerpt never claims that, compared with other animals, the platypus is the best resource for studying the evolution of animal genomes. The excerpt indicates that the platypus's status as a "scientific oddity" provides "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" (paragraph 6).

H. Incorrect. The excerpt states that the platypus genome is a "scientific oddity" (paragraph 6) that is useful to researchers, but the reason it is useful is because of DNA evidence that shows "a window into a time in history when mammals became unique" (paragraph 6), not because its genes have never been altered. Because the platypus genome, like that of all animals, has evolved over time, the statement that platypus genes have never been altered is inaccurate ("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' " [paragraph 12]).

51. The question asks how paragraphs 4–6 contribute to the development of ideas in the excerpt.

A. Incorrect. Although paragraph 6 states that the "platypus genome results are far more than confirmation of a scientific oddity," the paragraphs do not summarize the evidence that the platypus is an evolutionary peculiarity, an idea which is primarily described in paragraphs 12–14. Rather, paragraphs 4–6 indicate why researchers are interested in platypus genetics as a way to deepen their understanding of humans and other mammals.

B. Incorrect. Although the paragraphs suggest that research on platypus DNA can provide useful information about humans ("what can its DNA tell us about people and the diseases we get?" [paragraph 4]; "Plenty, says an international team of scientists who did this work" [paragraph 5]), they do not provide a transition to the study of the human genome. Instead, they explain that researchers are interested in the genetic material of the platypus because it helps them understand the evolutionary development of mammals ("The platypus genome results . . . provide researchers a window into a time in history when mammals became unique" [paragraph 6]). Mammals are a group that includes humans and many other species, and the researchers are interested in learning more about the evolutionary development of the larger group (mammals), not a single species of mammal (humans).

C. Incorrect. Although paragraph 6 refers to unique features of mammal species ("the ability to bear live young, produce milk for them, and grow a warm, furry coat"), the paragraphs primarily focus on the scientific relevance of the platypus genome results and do not highlight the idea that mammals are a diverse group with some similarities.

D. **CORRECT.** The paragraphs explain why the genetic material of the platypus (or their "genome results" [paragraph 6]) are interesting to scientists who study mammals, a group that includes human beings. Paragraph 4 asks "what can [platypus] DNA tell us about people and the diseases we get?" Paragraphs 5 and 6 answer the question posed in paragraph 4, stating that scientists believe we can learn "plenty" from platypus DNA because it provides 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."

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52. The question asks how paragraph 8 fits into the overall structure of the excerpt.

E. **CORRECT.** Paragraph 8 acts as a transition from the discussion of how "our own, modern-day genomes are still a big mystery" (paragraph 7) to the discussion of how scientists use comparative genomics to compare "human genes with those from animals" (paragraph 8).

F. Incorrect. Paragraph 8 describes scientists' primary interest in understanding the genetic evolution of humans, not animals, by comparing "human genes with those from animals." The paragraph does not clarify or provide details about how scientists study gradual changes in the genetic material of a given animal species.

G. Incorrect. Rather than contrasting the effort of the study of the human genome with the effort of a separate study of animal genomes, paragraph 8 discusses a study that is comparing human and animal genomes "to see what has been kept the same and what has evolved to be different."

H. Incorrect. While the mention in paragraph 8 of "3 billion DNA 'letters' " certainly highlights the enormous challenge of fully analyzing the human genome, the point of paragraph 8 is to transition the excerpt to the topic of how comparative genomics can shed light on the human genome.

53. The question asks for the best summary of the section "Same and Different" (paragraphs 9–11).

A. Incorrect. The fact that the platypus is the latest species whose genome is being compared with the human genome is just a detail of this section. The focus of the section is on the fact that comparing genomes can teach us about human diseases. Paragraph 9 reveals this when it states that "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."

B. Incorrect. While comparative genomics is a way to examine many different species, this detail is not the main point of this section. Paragraph 10 notes that the "goal of this research" focuses on the fact that comparing genomes can teach us about human diseases.

C. **CORRECT.** This sentence describes the most important idea of the section: the discovery of genes that humans have in common with other species that can yield information about human diseases. As stated in paragraph 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."

D. Incorrect. While this section does mention the use of computers in comparative genomics, this information is a detail about how the research is carried out; the computers are a tool in discovering whether "this information may translate into ways to understand, treat, and prevent human diseases" (paragraph 11).

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

E. Incorrect. The fact that "platypuses have genes that make the milk protein casein" (paragraph 13) just like humans do is an important supporting detail, but it is not a central idea of the excerpt.

F. Incorrect. While paragraph 14 explains that the platypus produces venom "like its ancestral snake and lizard cousins," which suggests the platypus has the ability to defend itself, this information is a supporting detail and not a central idea of the excerpt.

G. Incorrect. Paragraphs 12–14 do state that the platypus has lost some of its "chicken-ness" (paragraph 12) while gaining traits in common with mammals and reptiles, but this information is a supporting detail and not a central idea of the excerpt.

H. **CORRECT.** In describing the platypus's different abilities, paragraph 12 states that "the findings traced the evolutionary path from birds and reptiles to mammals." Paragraphs 12–14 elaborate on the findings to support a central idea of the excerpt, which is that the platypus is rare in having bird, reptile, and mammal DNA.

55. The question asks 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. Incorrect. The sentence from paragraph 2 describes the combination of DNA material from several classes of animals that makes up platypus DNA; however, the sentence does not address whether any of those different animals share traits or whether they share some of the same DNA.

B. Incorrect. The sentence from paragraph 3 emphasizes the relationship between two different classes of animals—reptiles and mammals—by discussing when they branched off the same evolutionary tree. However, the sentence does not address whether those classes of animals share any traits.

C. Incorrect. The sentence from paragraph 4 questions whether platypus DNA can teach people something about humans and human disease, which implies that there must be something in common between these two animals. However, it does not state that these two animals actually share traits or DNA.

D. **CORRECT.** The sentence from paragraph 14 describes two different classes of animals—reptiles and monotremes—that have the ability to create venom, a trait that resulted from the same DNA material "mixed and matched together."

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56. The question asks how researching the genomes of other animals can inform scientists' understanding of human health and disease.

E. Incorrect. Although tracking how other animals evolved helps researchers better understand our "rich and diverse planet" (paragraph 18) through understanding genes, the potential benefits to human health will not necessarily preserve or sustain nature.

F. **CORRECT.** Paragraph 11 explains that finding ways that animal genomes are similar to the human genome helps researchers "locate signals that control how genes work."

G. Incorrect. While paragraph 11 does point out that all living things share an ancestor, the idea that they, therefore, share genetic traits is only implied. This idea does not contribute to the main focus of the research.

H. Incorrect. The statement that "understanding how other animals are similar to one another helps researchers understand how humans evolved" is too general to provide support for the main focus of the genetic research described in the excerpt. To learn more about human health and disease, scientists need to understand the similarities between the genetic material of different animal species. These scientists are interested in learning more about issues that currently affect humans, not understanding their evolutionary history.

57. The question asks how the author elaborates on the idea that creating a full analysis of platypus DNA was an important scientific endeavor.

A. **CORRECT.** The importance of the research into platypus DNA is explained in the excerpt through descriptions of what this research can teach us about human genetics and disease. The question is raised directly in paragraph 4 and begins to be answered in paragraph 6 ("The platypus genome results . . . provide 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"). This importance is also addressed in the "Same and Different" section (paragraphs 9–11) and in paragraphs 15 and 16.

B. Incorrect. The comparison of the platypus with its bird and reptile relatives in paragraphs 12–15 is important to locating the platypus on its evolutionary family tree and in showing the connection between DNA and functionality. This comparison does not, however, explain the excerpt's main reason for asserting that the analysis of platypus DNA was an important scientific endeavor.

C. Incorrect. Although the excerpt mentions that part of the platypus's appeal is its "cuteness and weirdness" (paragraph 2) and describes it as having a "patchwork of genes" (paragraph 2), the scientific importance of analyzing the platypus genome is not derived from its unusualness but rather from its ability to shed light on the human genome through comparative genomics ("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" [paragraph 17]).

D. Incorrect. The excerpt briefly explains the connection between genes and some of the platypus's physiological functions, such as producing milk and venom (paragraphs 13 and 14). Although paragraph 15 mentions the scientific value of understanding these genetic connections ("Such investigations may help medical researchers understand health issues related to reproduction and lactation"), paragraph 16 indicates that there is even greater value in studying the platypus genome through comparative genomics ("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"). The full analysis of the platypus DNA was an important scientific endeavor primarily because it furthers the ability of scientists to understand "millions of years of evolution" and offers "vital information to understanding the role of genes in the health and disease of mammals like us" (paragraph 18). The discussion of physiological function itself is not the real importance of the scientific endeavor.

58. **(162)** To find angle x, first find the measure of angle PQR by finding the measure of angle PSR.

$m\angle PSR = m\angle PQR$
$m\angle PSR = 180 - 72$
$m\angle PSR = 108$

The measure of angle PQR is also 108.

Find the measure of angle x:

$108 + 90 + x = 360$
$198 + x = 360$
$x = 162$

---

59. **(99)** Let x be the number of oak trees when 264 pine trees are planted.

Set up a proportion and solve for x:

$$\frac{x}{264} = \frac{3}{8}$$
$8x = 762$
$x = 99$

---

60. **(-4)** $4w = 2w - 8$
$2w = -8$
$w = -4$

61. **(45)** Let x = number of students with only cats as pets. Let y = number of students with only dogs as pets.

Calculate x and y using the given information:

There are 20 students who have cats, and of those 20 students, 3 have both cats and dogs.

If 3 out of 20 students also have dogs, then $x = 20 - 3 = 17$

There are 23 students who have dogs, and of those 23 students, 3 have both cats and dogs.

If 3 out of 23 students also have cats, then $y = 23 - 3 = 20$

To find the total number of students surveyed, add the number of students who only have cats (x), the number of students who only have dogs (y), the number of students who have both (3), and the number of students who have neither (5):

$3 + 5 + x + y = 8 + 17 + 20 = 45$

62. **(63)** If x is the smaller consecutive integer, then $x+1$ is the larger consecutive integer. Use their sum (-15) to find x:

$x + (x+1) = -15$

$2x + 1 = -15$

$2x = -16$

$x = -8$

The two consecutive integers are -8 and -7.

One is added to the smaller integer: $-8 + 1 = -7$, and 2 is subtracted from the larger integer: $-7 - 2 = -9$.

Find the product: $-7 \times -9 = 63$

---

63. **(B)** $2k = m + 3$ so $k = \dfrac{m+3}{2}$.

Substitute each value of m to find the values of k:

$k = \dfrac{5+3}{2} = \dfrac{8}{2} = 4$

$k = \dfrac{7+3}{2} = \dfrac{10}{2} = 5$

$k = \dfrac{9+3}{2} = \dfrac{12}{2} = 6$

The set k is $\{4, 5, 6\}$.

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

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

$5 - n$

---

65. **(A)** The sum of Adrianna's course grades equals 4 times the mean (average) of her grades:

$90 \times 4 = 360$

Roberto has the same sum (360) as Adrianna. Find the mean of his course grades:

$360 \div 5 = 72$

66. **(H)** Set up some equations.

Jenny (J) has twice as many marbles as Keiko (K): $J = 2K$

Jenny gives Keiko 5 marbles, so now they each have: $J - 5$ and $K + 5$ marbles.

Jenny still has 10 more than Keiko:
$J - 5 = (K + 5) + 10$

To find how many marbles Jenny had to start with, solve $J = 2K$ for K and substitute that into the second equation:

In equation $J = 2K$, solve for K: $K = \frac{J}{2}$

Substitute $\frac{J}{2}$ in for K.

$$J - 5 = (K + 5) + 10$$
$$J - 5 = \left(\frac{J}{2} + 5\right) + 10$$
$$J - 5 = \frac{J}{2} + 15$$
$$J = \frac{J}{2} + 20$$
$$\frac{J}{2} = 20$$
$$J = 40 \text{ marbles}$$

$J = 40$ marbles

67. **(A)** Let x be the number of inches representing 1 foot. Set up a proportion and solve for x :

$$\frac{x}{1} = \frac{0.125}{125}$$
$x = 0.001$ in.

68. **(G)** To find the percentage of cars that contain at least 3 people, add the percentage of cars containing 3 people, 4 people, and 5 or more people:

$15\% + 7\% + 3\% = 25\%$

Thus, 25% of the cars contained **at least** 3 people. Use 25% to calculate the number of cars with at least 3 people.

$420 \times 0.25 = 105$ cars.

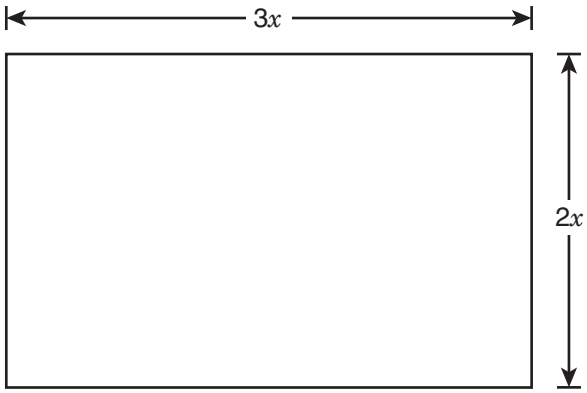
69. **(B)** Line segment $\overline{RS}$ is the altitude, or height, of triangle QRP. The length of $\overline{QP}$ is 8 cm.

Use the information to find the area of triangle QRP:

$A = \frac{1}{2}bh = \frac{1}{2}(8)(6) = 24$ sq cm.

There are 4 congruent triangles in the pyramid, so the surface area of the pyramid **excluding** the base is
$4 \times 24 = 96$ sq cm.

70. **(F)** Let $2x$ = the width and $3x$ = the length. Draw the rectangle to help visualize.



Since 2 times width + 2 times length = perimeter, we get

$2(2x) + 2(3x) = 510$

$4x + 6x = 510$

$10x + 510$

$x = 51$

$2x = 102$ cm and $3x = 153$ cm

71. **(D)** Multiply each term by 2 to eliminate the fraction, and isolate x :

$$-4(2) < \left(\frac{x}{2}\right)(2) < 2(2)$$

$-8 < x < 4$

Therefore, x must be between -8 and 4.

72. **(H)** Since both ratios have y in common, solve for x and z in terms of y in both equations.

Using $y{:}x = 1{:}4$, solve for x in terms of y .

$$\frac{x}{y} = \frac{1}{4}$$

$$x = \frac{1}{4}y$$

Using the ratio $y{:}z = 4{:}5$, solve for z in terms of y:

$$\frac{y}{z} = \frac{4}{5}$$

$$z = \frac{5}{4}y$$

The question states $x + y + z = 50$. Substitute from the two equations above and solve for y .

$$\frac{1}{4}y + y + \frac{5}{4}y = 50$$

$$\frac{10}{4}y = 50$$

$10y = 200$

$y = 20$

73. **(B)** Let x be the total number of colored pencils in the box.

Set up a proportion to find x :

$$\frac{2}{7} = \frac{6}{x}$$
$$2x = 42$$
$$x = 21$$

If there are 6 red pencils, then the number of pencils that are not red is $21 - 6 = 15$.

---

74. **(F)** Use proportions to make the conversions:

Lorgs to dollars:

$$\frac{140}{x} = \frac{7}{1}$$
$$7x = 140$$
$$x = \$20$$

Dalts to dollars:

$$\frac{16}{x} = \frac{0.5}{1}$$
$$0.5x = 16$$
$$x = \$32$$

Total dollars $= 20 + 32 = \$52$

75. **(B)** The shaded region is a right triangle. Each leg is 1 unit in length.

So the area is $A = \frac{1}{2}bh = \frac{1}{2}(1)(1) = \frac{1}{2}$ or 0.5 sq unit

---

76. **(F)** Create a table with the information provided in the problem and use subtraction to fill in the rest of the table:

	Female	**Male**	**TOTAL**
Commutes to work	21%	**39% (60 - 21)**	60%
Does not commute to work	**24% (41 - 21)**	**16% (40 - 24)**	**40% (100 - 60)**
TOTAL	45%		100%

16% of the population is male and does not commute to work.

---

77. **(A)** Let x be the price per pound for the meat. Set up an equation to show what Mrs. Cranston spent:

$$5(0.90) + 8x = 26.90$$
$$4.50 + 8x = 26.90$$
$$8x = 22.40$$
$$x = 2.80$$

The price per pound for the meat is \$2.80

78. **(E)** The probability that both cards are not blue is the same as the probability that both cards **are** red.

There are 4 red cards out of the 10, so the probability of the first card being red is $\frac{4}{10}$.

Now there are 9 cards left, and 3 of those are red, so the probability of the second card being red is $\frac{3}{9}$.

Multiply the two probabilities to find the probability that both cards are red (not blue):

$$\frac{4}{10} \times \frac{3}{9} = \frac{12}{90} = \frac{2}{15}$$

---

79. **(D)** 1 sind = 4 lorgs, so 1 sind > 1 lorg.

2 harps = 5 sinds, so 1 harp > 1 sind.

1 plunk = 3 harps, so 1 plunk > 1 harp, meaning that 1 plunk > 1 sind and 1 lorg.

2 plunks = 5 dalts, so 1 plunk > 1 dalt.

Therefore, the plunk is the most valuable.

80. **(F)** Let x be the number of second-, third-, and fourth-year students. Then the total number of students in the college is $663 + x$

Set up a proportion and solve for x:

$$\frac{15}{1} = \frac{663 + x}{179}$$
$$663 + x = 179(15)$$
$$663 + x = 2{,}685$$
$$x = 2{,}022$$

---

81. **(B)** According to the chart, 22% of people walk to work and 4% ride a bicycle.

Subtract to find the percentage of how many more people walk than bicycle:

$$22\% - 4\% = 18\%$$

To find the exact number of people, multiply 18% (0.18) by the number of people working in Center City (15,000):

$$15{,}000 \times 0.18 = 2{,}700$$

---

82. **(F)** To find the smallest factor of 91, list the factors: 1, 7, 13, and 91.

The smallest factor (other than 1) is 7.

Of the options listed (30, 35, 39, and 44), only 35 is a multiple of 7.

83. **(D)** Let x be the remaining side of the actual banner.

Set up a proportion:

$$\frac{x}{16} = \frac{36}{12}$$

$x = 48$ ft

---

84. **(G)** For each row, multiply the number of students by the score.

Add the products together and divide by the total number of students to find the mean (average) of the 10 students.

$$\frac{85(4) + 75(4) + 65(2)}{10} = \frac{340 + 300 + 130}{10}$$

$$= \frac{770}{10} = 77$$

85. **(C)** The first integer is l, so the second is $l + 1$, the third is $l + 2$, then $l + 3$, and finally $l + 4$.

Since g is the fifth and greatest of the integers, $g = l + 4$

Substitute $l + 4$ for g and simplify:

$$\frac{l + g}{2} = \frac{l + l + 4}{2} = \frac{2l + 4}{2} = l + 2$$

---

86. **(F)** Divide the rate by the number of seconds in an hour. (Find the number of seconds in an hour. There are 60 minutes in an hour and 60 seconds in a minute: $60 \times 60 = 3{,}600$ seconds in an hour.):

$\frac{55}{3{,}600}$ miles per second

Multiply by the number of feet in a mile (5,280):

$\frac{55 \times 5{,}280}{3{,}600}$ feet per second

87. **(D)** Set up an equation to express Tien's age (T) and Jordan's age (J) today:

$$T = \frac{1}{4}J$$

Two years from now, Tien's age will be $T + 2$ and Jordan's age will be $J + 2$ Set up an equation about the relationship between Tien's age and Jordan's age in two years:

$$T + 2 = \frac{1}{3}(J + 2)$$

Solve the above equation for T:

$$T = \frac{1}{3}(J + 2) - 2$$

Now set the two equations equal to each other and solve for J:

$$\frac{1}{4}J = \frac{1}{3}(J + 2) - 2$$
$$\frac{1}{4}J = \frac{1}{3}J - \frac{4}{3}$$
$$-\frac{1}{12}J = -\frac{4}{3}$$
$$J = -\frac{4}{3}\left(-\frac{12}{1}\right)$$
$$J = 16$$

88. **(E)** List the factors of 48:

1 and 48, 2 and 24, 3 and 16, 4 and 12, 6 and 8

There are no factors greater than 24 and less than 48.

---

89. **(D)** $2\frac{1}{5} + 3\frac{3}{10} + 4\frac{2}{5} + 5\frac{1}{2}$

Convert all the fractions to a common denominator (10):

$$2\frac{2}{10} + 3\frac{3}{10} + 4\frac{4}{10} + 5\frac{5}{10}$$
$$= (2 + 3 + 4 + 5) + \left(\frac{2 + 3 + 4 + 5}{10}\right)$$
$$= 14 + 1\frac{4}{10} = 15\frac{2}{5}$$

---

90. **(G)** The length of the stick must be the greatest common factor of 72 and 30. The factors of 30 are 1, 2, 3, 5, 6, 10, 15, and 30. Of those, only 1, 2, 3, and 6 are also factors of 72. The greatest of these is 6.

91. **(B)** Create a list of the possible pairs. Let the cookies be named A, B, C, D, E, and F.

AB, AC, AD, AE, AF

BC, BD, BE, BF

CD, CE, CF

DE, DF

EF

There are a total of 15 possible pairs of cookies that Aiden can choose.

92. **(G)** Set up proportions to figure out how many slides Deion and Kyra can create in 1 hour:

Deion

$$\frac{5}{20} = \frac{x}{60}$$
$$20x = 300$$
$$x = 15$$

Deion can create 15 slides in 1 hour.

Kyra

$$\frac{3}{10} = \frac{x}{60}$$
$$10x = 180$$
$$x = 18$$

Kyra can create 18 slides in 1 hour.

Add Deion and Kyra to figure out how many slides they can create together in 1 hour:

$$15 + 18 = 33$$

93. **(C)** Since $LN = \frac{1}{8}$, point N is located at $4\frac{5}{16} + \frac{1}{8} = 4\frac{7}{16}$.

So M must be between point L, $4\frac{5}{16}$, and point N, $4\frac{7}{16}$.

Point L can also be written as 4.3125, and point N can be written as 4.4375.

The only option given that lies between those two points is 4.35.

94. **(H)** Three years is 36 months (12×3). Set up an expression to find the total amount Johan paid:

$$1{,}000 + 300(36) = \$11{,}800$$

---

95. **(B)** Ryan has 130 pages left to read $(150 - 20)$. He read 20 pages in 30 minutes, which means he read at a rate of 40 pages per 1 hour. To find out how much longer it will take him to finish the assignment, divide the total number of pages remaining (130) by the number of pages he is able to read per hour (40):

$$\frac{130}{40} = 3\frac{1}{4}$$

---

96. **(G)** It is easier to rewrite $\frac{M}{N}$ as $M \div N$ since they are both fractions.

$$M \div N = \frac{w}{x} \div \frac{y}{z} = \frac{w}{x} \times \frac{z}{y} = \frac{wz}{xy}$$

97. **(B)** The question asks for integers from 12 to 30 that are not divisible by 2 or 3.

The set of consecutive integers is {12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30}.

Since all even numbers are divisible by 2, eliminate all even numbers, leaving the odd numbers in the set: {13, 15, 17, 19, 21, 23, 25, 27, 29}.

Eliminate those integers that are multiples of 3 (15, 21, and 27). The remaining integers are: {13, 17, 19, 23, 25, 29}. Therefore, there are 6 numbers in the set that are multiples of **neither** 2 nor 3.

---

98. **(F)** Since $3n$ is even, then $3n + 1$ must be odd. If $3n + 1$ is odd, then $3n + 3$ and $3n + 5$ are also odd. So there are a total of 3 numbers in this range that are odd.

99. **(C)** The total number of candies in the box is $5 + 3 + 2 = 10$. The number of candies that are not banana is $5 + 2 = 7$.

The probability of the first candy not being banana is $\frac{7}{10}$. Now, out of 9 candies, there are 6 candies left that are not banana. The probability of the second candy not being banana is $\frac{6}{9}$. Multiply these two probabilities to get the solution:

$$\frac{7}{10} \times \frac{6}{9} = \frac{42}{90} = \frac{7}{15}$$

---

100. **(H)** Solve the equation for z:

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

$$wz = xy$$

$$z = \frac{xy}{w}$$

101. **(C)** Convert the ratios into fractions of WZ. Use the sum of the ratios for the denominator.

WX:XY:YZ = 4:2:3

$$WX = \frac{4}{4 + 2 + 3} = \frac{4}{9}$$

$$XY = \frac{2}{4 + 2 + 3} = \frac{2}{9}$$

The part of WZ that is WY is the sum of those fractions:

$$WY = \frac{4}{9} + \frac{2}{9} = \frac{6}{9} = \frac{2}{3}$$

Find the length of WZ:

$$WZ = 8 - (-10) = 18$$

The value of WY is $\frac{2}{3}(18) = 12$.

---

102. **(G)** Find 1% of 0.02:

$$0.02 \times \frac{1}{100} = 0.0002$$

The greatest allowable thickness would be $0.02 + 0.0002 = 0.0202$ inch.

103. (D) Calculate the highest score for each section by adding the lowest score to the range:

Section I: 65 + 28 = 93

Section II: 62 + 25 = 87

Section III: 67 + 22 = 89

The overall highest score is 93, and the overall lowest score is 62.

Subtract the lowest score from the highest score to find the overall range: 93 - 62 = 31

---

104. (G) Take each city's number of schools and multiply by the number of students. It is not necessary to calculate all 5 of these. Cities M and N have the same number of students, so just calculate the number of students in City M because it has more schools than City N. The same goes for Q and R — only Q needs to be calculated because it has more schools than R.

$M = 8 \times 500 = 4{,}000$

$P = 9 \times 400 = 3{,}600$

$Q = 6 \times 700 = 4{,}200$

City Q has the greatest number of students.

105. (D) There are 6 digits in the repeating decimal (769230), so 7 would be the first, seventh, thirteenth digit and so on. To find the 391st digit, divide 391 by 6.

$391 \div 6 = 65$ R1

Since the remainder is 1, that means the 391st digit is the same as the 1st digit, which is 7.

---

106. (E) One revolution is equal to the circumference of the tire:

$$C = 2\pi r = 2(1)(\frac{22}{7}) = \frac{44}{7}\ ft$$

The car travels at 4,400 ft per minute. To calculate the number of revolutions, divide the speed by the circumference:

$$4{,}400 \div \frac{44}{7} = 4{,}400 \times \frac{7}{44} = 700$$

revolutions.

107. (D) $100(2+0.1)^2 - 100 = 100\left(2.1^2\right) - 100$

$= 100(4.41) - 100 = 441 - 100 = 341$

---

108. (G) The total number of handballs in the container is $4+5+8+9+11 = 37$.

Since there are 8 yellow handballs, the probability of selecting a yellow handball is $\frac{8}{37}$.

109. (A) Each chair costs Leon \$150 to make, and he sells the chair for \$275. His profit is found by subtracting the cost from the price:

$\$275 - \$150 = \$125$ per chair

If Leon makes and sells 25 chairs in a week, his initial profit is $25 \times \$125 = \$3{,}125$. However, Leon has additional fixed expenses of \$1,250 per week, so this cost must also be subtracted to arrive at the profit. His final profit is $\$3{,}125 - \$1{,}250 = \$1{,}875$.

---

110. (H) Convert 4 ft 7 in. to inches.

Since 12 in. = 1 ft

$4(12) + 7 = 55$ inches

Multiply that by the conversion:

254 cm = 1 in.

$55 \times 2.54 = 139.70$ cm

111. (C) Find the location of J by using

$JK = 3\frac{1}{2}$:

$\frac{3}{8} - J = 3\frac{1}{2}$

$J = \frac{3}{8} - 3\frac{1}{2} = -3\frac{1}{8}$

Find the location of M by using $JM = 9\frac{3}{4}$:

$M - \left(-3\frac{1}{8}\right) = 9\frac{3}{4}$

$M + 3\frac{1}{8} = 9\frac{3}{4}$

$M = 9\frac{3}{4} - 3\frac{1}{8} = 6\frac{5}{8}$

Use $LM = 1\frac{1}{8}$ to find the location of L:

$6\frac{5}{8} - L = 1\frac{1}{8}$

$L = 6\frac{5}{8} - 1\frac{1}{8} = 5\frac{4}{8} = 5\frac{1}{2}$

112. (G) $4x - 3y = 12$

$4x = 3y + 12$

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

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

113. **(A)** Determine the total number of servings of fruits and vegetables that the students ate by multiplying the number of servings by the number of students in each row of the table. Then add that column to get the total number of servings:

Number of Servings of Fruits and Vegetables	**Number of Students**	**Number of Servings × Number of Students**
0	5	0
1	7	7
2	3	6
3	4	12
4	0	0
5	1	5
Total: 30		

Calculate the mean by dividing the total number of servings of fruits and vegetables by the total number of students:

$$\frac{30}{20} = 1\frac{1}{2}$$

114. **(G)** The ratio is 4:3:2:1, so the total parts is 10.

Since there are two parts resin, the fraction of resin is $\frac{2}{10} = \frac{1}{5}$.

So the amount of resin in 30 lb of paste (for 1 billboard) is $\frac{1}{5} \times 30 = 6$ lb.

For 4 billboards, that would be $6 \times 4 = 24$ lb.

Answer Key for Sample Form A

1. A	14. E	27. C	40. G	53. C	66. H	79. D	92. G	105. D
2. F	15. C	28. H	41. D	54. H	67. A	80. F	93. C	106. E
3. A	16. E	29. A	42. E	55. D	68. G	81. B	94. H	107. D
4. H	17. B	30. F	43. A	56. F	69. B	82. F	95. B	108. G
5. B	18. G	31. D	44. H	57. A	70. F	83. D	96. G	109. A
6. E	19. B	32. G	45. D	58. 162	71. D	84. G	97. B	110. H
7. B	20. E	33. A	46. E	59. 99	72. H	85. C	98. F	111. C
8. H	21. D	34. H	47. C	60. -4	73. B	86. F	99. C	112. G
9. B	22. E	35. B	48. F	61. 45	74. F	87. D	100. H	113. A
10. F	23. A	36. F	49. D	62. 63	75. B	88. E	101. C	114. G
11. D	24. H	37. C	50. E	63. B	76. F	89. D	102. G	
12. H	25. D	38. H	51. D	64. E	77. A	90. G	103. D	
13. B	26. G	39. B	52. E	65. A	78. E	91. B	104. G	