The New York City Department of Education

2023 **Specialized High School Admissions Test**

GENERAL DIRECTIONS

Student Name: _____

Identifying Information

Turn to Side 1 of the answer sheet.

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

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

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

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

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

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

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

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

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

Grid 7:

1. Print the name of the school where you are now enrolled in the space at the top of the grid.

2. In the boxes marked "SCHOOL CODE," print the six-digit code that identifies your school and fill in the circle under the corresponding number or letter for each digit of the school code. (You can find your school code on your Test Ticket. If it is not there, tell the proctor, and the proctor will get the school code for you.)

3. If you attend a private or parochial school, fill in the circle marked "P."

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

> **DO NOT OPEN THIS BOOKLET**
> **UNTIL YOU ARE TOLD TO DO SO.**
>
> **TURN YOUR BOOKLET OVER TO THE BACK COVER.**

TAP TO START SHSAT PREP

General Directions, continued

Identifying Information, continued

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

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

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

Marking Your Answers

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

```
SAMPLE ANSWER MARKS

 (A)   (B)   (C)   ●     RIGHT
 (A)   (B)   (C)   (D)   WRONG
 (A)   (B)   (C)   (D)   WRONG
 (A)   (B)   (C)   (D)   WRONG
 (A)   (B)   ●     ●     WRONG
```

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

TAP TO START SHSAT PREP

Pearson

A

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

REVISING/EDITING
QUESTIONS 1-16 (PART A AND PART B)

REVISING/EDITING PART A

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

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

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

A. continents. At
B. surface; additionally,
C. Panthalassa. Much
D. crust, in fact,

2. Read this sentence.

> The Appalachian Trail is a really long trail that a lot of people do each year.

Which revision of the sentence uses the **most** precise language?

E. The Appalachian Trail is an extremely long trail that millions of people do each year.
F. The Appalachian Trail is a 2,200- mile trail that more than a million people hike each year.
G. The Appalachian Trail is a 2,200- mile trail that two million people hike each year.
H. The Appalachian Trail is a lengthy trail that a couple million people do each year.

TAP TO START SHSAT PREP

3. What is the **best** way to combine these sentences to clarify the relationship between ideas?

> (1) The International Space Station has been inhabited by crew members since 2000.
>
> (2) Tourists will soon be allowed to pay for visits to the space station.
>
> (3) Because the cost is $52–$58 million round trip, few people will be able to take advantage of the opportunity to have a vacation in outer space.

A. The International Space Station has been inhabited by crew members since 2000, but tourists will soon be allowed to pay for visits to the space station, which cost $52–$58 million round trip, so few people will be able to take advantage of the opportunity to have a vacation in outer space.

B. The International Space Station has been inhabited by crew members since 2000 and will soon allow tourists to pay for visits, but because the cost is $52–$58 million round trip, few people will be able to take advantage of the opportunity to have a vacation in outer space.

C. The International Space Station has been inhabited by crew members since 2000, but tourists will soon be allowed to pay for visits to the space station, though the cost is $52–$58 million round trip, so few people will be able to take advantage of the opportunity to have a vacation in outer space.

D. The International Space Station has been inhabited by crew members since 2000, and tourists will soon be allowed to pay for visits to the space station because the cost is $52–$58 million round trip, therefore few people will be able to take advantage of the opportunity to have a vacation in outer space.

4. 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.

E. Insert a comma after *agile*.

F. Insert a comma after *first*.

G. Insert a comma after *only*.

H. Insert a comma after *States*.

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

The Local Library

(1) According to a 2015 survey, more than two-thirds of Americans own a smartphone, which means that obtaining information or communicating with people is easier than ever before. (2) With the swipe of a finger, the tap of an icon, or a verbal command, people have instant access to articles, blogs, news, and social networking websites. (3) Even with all these immediately available sources of information, one of the best resources for many members of the community also happens to be one of the oldest. (4) The public library is a great place for people to get information.

(5) The public library serves a truly critical role in promoting community. (6) With the explosion of digital media in recent years, people in different locations can now communicate almost instantaneously. (7) And yet many people complain of feeling more isolated and alone than ever before. (8) The library stands in a rare position to help community members meet this universal need for human connection and companionship.

(9) Furthermore, libraries provide certain amenities, such as access to the Internet, for free to all people. (10) A student who does not have a computer at home can research and type a paper for school. (11) Similarly, an unemployed adult without access to the Internet can make use of library resources to find job opportunities. (12) The free items that are found at the library can help people get a lot done.

(13) Public libraries also offer a variety of resources to community members. (14) One important resource is the local librarian, who does far more than check out books and collect fines. (15) Other library resources include free or low-cost tutoring and training programs. (16) Additionally, lectures, book groups, and town meetings promote critical thinking and community engagement. (17) A typical librarian holds a master's degree and can help library patrons navigate through the flood of information available in print and on the Internet.

(18) The hallmark of a public library is that its materials and services are accessible to all. (19) The library connects people to a network of information and resources and is an important part of a community.

6. Which sentence should replace sentence 4 to best introduce the main claim of the passage?

A. In this age of smartphones and search engines, the public library is a valuable resource that all members of a community should use.

B. Finding information is easier than ever, but going to the public library is still a valuable learning experience.

C. Though today's computers are highly advanced, the resources available at a public library are more useful for students.

D. Despite the proliferation of social networking sites, a public library is a great place for people who are interested in improving their community.

7. Which sentence would best follow and support sentence 8?

E. Libraries, which have been around for centuries and are found throughout the world today, help preserve the history of a community.

F. The public library is often used as a place for community leaders and organizers to host community events, such as hearings or town halls.

G. Libraries rely on a combination of local, state, and federal dollars to provide the kinds of services and programs that community members have come to expect.

H. At a public library, people can interact with others through a variety of programs, including teen book clubs, toddler story times, and senior-citizen exercise classes.

8. Which revision of sentence 12 best maintains the formal style established in the passage?

A. The free resources available at the library can help people accomplish many tasks.

B. All the free materials you can get at the library can help you do many different tasks.

C. Everything that is free at the library can help people work on a lot of different things.

D. The free resources you can find at the library can help you do whatever you need to do.

12. Which sentence could best follow sentence 16 and support the main point of the fourth paragraph (sentences 17-18)?

E. Bike share programs are developed in cities mainly to improve air quality.

F. Participating in a bike share program is the main way travelers can improve air quality in cities.

G. Cities may begin to experience improved air quality as more travelers use bike share programs.

H. Bike share programs may be more effective at improving air quality in some cities than they are in other cities.

13. Which sentence is irrelevant to the ideas in the third paragraph (sentences 11-16) and should be deleted?

A. sentence 11

B. sentence 12

C. sentence 13

D. sentence 14

14. Which concluding sentence should replace sentence 20 to better support the information presented in the passage?

E. Over time, bike sharing may become a routine part of modern urban life.

F. Even small or medium-sized cities can benefit from implementing a bike share program.

G. Compared with other solutions, bike sharing seems to have the most potential.

H. Ultimately, bike sharing is an interesting and unique way for tourists to explore a city.

SCORES ON BIOLOGY TEST

Section	Lowest Score	Range

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 car travels at [illegible] feet per minute. The radius of each tire on the car is 1 foot. How many revolutions does one of these tires make in 3 minutes? (Use the approximation $\frac{22}{7}$ for π.)

F. 700
G. 1,925
H. 13,820
K. 15,400

105. $100(2 + 9.1)^2 - 100 =$

A. 323
B. 296
C. [illegible]

104. [illegible] is a positive even number, how many **odd** numbers are in the range [illegible] up to and including $3n - 2$?

106. $\frac{[illegible]}{[illegible]} = 6.768320$

In the infinitely repeating decimal above, 7 is the first digit in the repeating pattern. What is the 301st digit?

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

READING COMPREHENSION
QUESTIONS 11–57

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.

TAP TO START SHSAT PREP

The Year without a Summer

1. The eruption of the Philippine volcano Mount Pinatubo in June 1991 sent a huge cloud of gas and dust encircling the globe. The dust and ash from Mount Pinatubo was blamed for a two-year decrease in global temperature, changes in weather patterns, and damage to the ozone layer. The situation brings to mind a time now remembered as "The Year without a Summer," a meteorological event that occurred 175 years earlier. At that time, harsh weather conditions plagued much of eastern North America and, to a lesser extent, northern Europe.

2. April 1816 brought typical spring weather to upstate New York and New England; trees budded, and farmers prepared to plow and plant. In May, however, the expected warm temperatures failed to arrive. Most people remained optimistic, waiting for the summer that was "just around the corner." They waited in vain. During the first week of June, ten inches of snow fell on New England. Throughout the month, temperatures rarely rose above the 30s. Many farmers replanted crops several times, only to see them stunted or destroyed by sleet, hail, and icy winds. July and August brought little improvement. During most days the temperature stayed in the 40s. Farmers' diaries document the farmers' daily struggles with near-freezing temperatures, failing crops, and dying farm animals. The few crops that managed to survive were killed by frost in mid-September. Winter came early in New England and was unusually severe. Even the South was affected; on July 4, the high temperature for Savannah, Georgia, was only 46 degrees Fahrenheit!

3. Some religious leaders warned their congregations that the unusual weather meant that the end of the world was drawing near. Other leaders attributed the cool weather to unusual sunspot activity. The proliferation of the newly invented lightning rod was also blamed as some people believed that lightning rods had interrupted the natural temperature balance of Earth, causing the cooler temperatures.

4. It was not until October that the first plausible explanation for "The Year without a Summer" was suggested. Friedrich Bessel, a German astronomer, reported seeing thick clouds of dust in the upper atmosphere. He theorized that these dust particles screened portions of Earth from the warming rays of the sun. It was discovered that in April 1815, Mount Tambora, an Indonesian volcano, had erupted with such force that it had sent an estimated 100 cubic miles of fine dust into the atmosphere. Witnesses to the eruption reported that the sky remained dark for two days. The dust then rose high into the stratosphere, where it encircled the world for several years to come.

5. Skeptics in 1816 doubted that a faraway volcano could steal their summer. However, most present-day researchers believe Bessel's explanation to be generally correct, demonstrating the global nature of weather. The dust in the atmosphere eventually settled, and the spring of 1817 was back to normal.

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

   A. the belief of some religious leaders that the end of the world was coming in 1816
   B. a summer of strange weather and its probable cause
   C. the importance of summer weather to agriculture in New England
   D. a comparison of the weather of 1816 and 1991

TAP TO START SHSAT PREP

12. What is the most likely reason farmers persisted in replanting their crops?

   E.They believed that the cold weather could not continue all summer long.
   F.They thought that crops would be able to survive even though the weather remained cold.
   G.They believed that the improved weather conditions of July would last.
   H.They thought the June snowfalls would provide needed moisture.

13. In the winter that followed the summer of 1816, New Englanders most likely experienced

   A.new weather events that they had not encountered before.
   B.temperatures that were warmer than usual for that time of year.
   C.shortages of fruits, vegetables, and other essential crops.
   D.difficulty adjusting to a different timeline for planting crops.

14. How does paragraph 3 contribute to the passage?

   E.It presents the most probable cause of the 1816 weather.
   F.It shows how nineteenth-century people explained the 1816 weather.
   G.It presents a theory about the 1816 weather that some skeptics doubted.
   H.It includes eyewitness reports to describe the source of the 1816 weather.

15. The author includes the details in paragraph 4 about the eruption of Mount Tambora in order to

   A.suggest that the aftermath of the eruption still affects the environment today.
   B.highlight the severe impact that the eruption had on the atmosphere.
   C.provide a description of what happens during a volcanic eruption.
   D.emphasize how differently people perceive natural events in various parts of the world.

16. Which of the following is implied by the phrase "the global nature of weather" (paragraph 5)?

   E.Understanding weather events around the world is important for making weather predictions.
   F.Extreme weather conditions in some parts of the world can have a lasting impact on a geographical area.
   G.Natural disasters tend to occur in different parts of the world at the same time.
   H.Conditions in one part of the world can affect weather in another part of the world.

TAP TO START SHSAT PREP

Excerpt from "Scribe Like an Egyptian"

by Hilary Wilson

1 In ancient Egypt, literacy was the key to success. However, contrary to popular belief, not all Egyptian scribes understood hieroglyphs. Many relied instead on the simpler hieratic script for the multitude of everyday documents generated by the Egyptian bureaucracy.1

2 Hieroglyphs—"the Words of God"—compose a writing system with more than 1,000 distinct characters, the meanings of which were lost for 1,500 years before they were deciphered by Jean-François Champollion in 1822. Including both ideograms (which convey a whole word or idea, either concrete or abstract, in a single sign) and phonograms (representing either an alphabetic sound or a group of consonants), [the writing system] was used in formal inscriptions on tomb and temple walls as well as on elaborate funerary papyri.2 For everyday purposes, however, scribes used a shorthand version of the hieroglyphic script known as hieratic, which was quicker to write and more economical of space. The two writings existed side by side for at least 2,500 years.

3 Scraps of ancient hieratic writing, mostly penned by student scribes on limestone flakes called ostraca, suggest that no matter how humble his origins, an educated Egyptian could achieve almost anything. Horemheb (d.1292 B.C.) is a good example. Born of middle-ranking parents, his scribal training led to an army career. From Scribe of Recruits, during the reign of Akhenaten (1353–1336 B.C.), Horemheb rose through the military ranks and, by the rule of Tutankhamun (1332–1323 B.C.), he was commander in chief of the Egyptian forces. As a close adviser of the young Pharaoh, Horemheb was appointed "Deputy of the King throughout the Two Lands," and might have expected to succeed to the throne should the king die childless. He had to wait a few years, but eventually Horemheb achieved the pinnacle of his career by becoming the last king of the 18th Dynasty, making his mark by instituting dramatic reforms to the organisation of the army, the judiciary and administration in general. The lasting success of these changes owed much to his scribal background. . . .

4 But education was not available to all. Government departments and major temples supported schools, where boys commenced their training at six or seven, sometimes earlier. To these boarding establishments . . . family or household servants delivered the students' food and drink rations daily for several years, during which time the student was not contributing to the family's income. Boys from poorer families could only hope to be educated with support from a wealthier relative or patron, or through apprenticeship to an older scribe, perhaps the local clerk or land agent, who would teach them the basics of the scribe's craft. This limited the scope for employment but such "on the job" training allowed apprentices to help out at home while learning. . . .

5 Scribal education began with the elementary principles of the hieratic script. The lowliest scribes, who trained for just five or six years, probably learned only the rudiments3 of the hieroglyphic

---

1 **bureaucracy:** an administrative staff of government officials

2 **funerary papyri:** a sheet or scroll of papyrus containing religious images and hieroglyphs

meant to help the deceased be reborn in the afterlife

3 **rudiments:** basics

TAP TO START SHSAT PREP

script. Students were set exemplar documents and extracts from popular texts to copy, to practice their hieratic handwriting on basic-format letters, reports and contracts, while absorbing the good advice contained in the texts. Surviving examples of copy- work sometimes include tutors' corrections added in red. Some significant Egyptian literary works survive almost exclusively from student copies.

6 A schoolboy4 "dictionary" of hieroglyphs with their hieratic equivalents shows that a knowledge of more than 450 signs was required for everyday writing purposes. Lessons in record-keeping and filing and labelling enabled any half- competent scribe to perform that most essential of all scribal functions: the making and updating of lists. For professions such as those of government official, priest or lawyer, a scribe would train for several more years, increasing his vocabulary to perhaps a thousand or more signs. Those with the best handwriting or drawing skills might follow the craft of creating beautifully illustrated copies of funerary texts, commonly called *Books of the Dead*. Others could become draughtsmen5, artists or architects. Doctors compiled their own collections of medication recipes, treatments and associated incantations, many copied from texts found in the House of Life, the temple library. Lawyers had to be familiar with the corpus6 of civil and religious laws and precedents found in the official records, which were administered by archivists. Egypt's bureaucratic society depended on the skills of an army of scribes of all ranks from filing clerk to tax assessor. For young Egyptians, "be a scribe" was the best of career advice.

---

4 schoolboy: slang that refers to materials used during the course of receiving an education

5 draughtsmen: a person who draws plans of machinery or structures

6 corpus: a collection of writings

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

A. how the sense of smell affects taste
B. the science of how taste buds work
C. the analysis and creation of flavors
D. why some flavors cannot be reproduced
E. the search for the perfect aroma

32. What is the principal goal of the scientific research described in the third paragraph?

F. to predict consumer taste preferences
G. to develop artificial foods with strong flavors
H. to monitor the use of artificial food additives
J. ...
K. to invent entirely new flavors

33. Which ... flavoring experts ...

A. People prefer the taste of oranges to strawberries.
B. The taste of strawberries is more complicated than most other flavors.
C. The gas chromatograph has not yet been used to analyze strawberries.
D. Most people prefer artificial strawberry flavor to a natural flavor.
E. Fruit flavors cannot be duplicated successfully.

34. Which of the following can be concluded about collecting aromas during food preparation?

F. The flavors of odorless foods can now be duplicated.
G. Artificial flavors do not make food taste better.
H. Certain chemical components of a food's flavor are present in its odor.
J. Uncooked food is more flavorful than cooked food.
K. The flavor of a food is always improved by cooking it.

35. What is the most likely reason that the author mentioned orange soda in the fourth paragraph?

A. to give an example of a well-liked flavor that has no natural counterpart
B. to explain why artificial orange flavor has not yet been produced
C. to describe how the aroma of oranges can be used to help reproduce its flavor
D. to demonstrate that consumers sometimes prefer flavor substitutes to the natural flavors they mimic
E. to give an example of a flavor you cannot taste without the sense of smell

36. According to the passage, some flavorists are concerned that ...

F. artificial flavors are more expensive to produce than natural flavors.
G. ... are not as healthy as ...
H. many people prefer bland food to tasty food.
J. artificial flavors are added to consumer products other than food.
K. people may come to strongly prefer artificial flavors over natural flavors.

ANCIENT EGYPTIAN
SOCIAL CLASS STRUCTURE

17. Which sentence from the excerpt **best** supports the idea that there were different levels of education for a scribe?

A. "However, contrary to popular belief, not all Egyptian scribes understood hieroglyphs." (paragraph 1)

B. "For everyday purposes, however, scribes used a shorthand version of the hieroglyphic script known as hieratic, which was quicker to write and more economical of space." (paragraph 2)

C. "This limited the scope for employment but such 'on the job' training allowed apprentices to help out at home while learning." (paragraph 4)

D. "For professions such as those of government official, priest or lawyer, a scribe would train for several more years, increasing his vocabulary to perhaps a thousand or more signs." (paragraph 6)

18. Read this sentence from paragraph 2.

Including both ideograms (which convey a whole word or idea, either concrete or abstract, in a single sign) and phonograms (representing either an alphabetic sound or a group of consonants), [the writing system] was used in formal inscriptions on tomb and temple walls as well as on elaborate funerary papyri.

The author's purpose for including the sentence is to

E. explain that hieroglyphs were reserved for royal and religious purposes.
F. demonstrate the methods experts use to interpret hieroglyphs.
G. clarify the significance of hieroglyphs in language and literature.
H. describe the basic features of hieroglyphs and how they were typically used.

19. Which statement summarizes the process that schools used to train scribes?

A. Boys had to memorize around 450 hieratic signs. Once they had learned these, they were expected to copy literary texts that contained valuable lessons.
B. Boys spent at least five years learning hieratic signs, which they practiced by copying texts. During this period, they were also introduced to basic hieroglyphs.
C. Boys spent five or six years learning the basics of hieratic script. After this period, they could become apprentices and begin learning hieroglyphics.
D. Boys were taught two different scripts. They practiced both types by copying lists and eventually progressed to writing letters, reports, and contracts.

20. Which claim is **best** supported by the information presented in paragraphs 3 and 4?

E. Education was difficult for the common citizens of Egypt to obtain.
F. Once students began studying to become scribes, their future held more possibilities.
G. If someone wanted to become a scribe, support from outside sources such as the government or a temple was necessary.
H. Becoming a successful scribe required a student's family to sacrifice time and money in order to ensure the best education.

TAP TO GET FULL SHSAT MATERIALS & PREP

This narrative is about the Nez Perce, an American Indian tribe, in what is now northern Idaho. The tribe is preparing for a gathering before the coming winter.

Excerpt from *Do Them No Harm!*

by Zoa L. Swayne

1 In the moon of Ta-Yum, the hottest days of summer, when salmon spawn in the little streams and huckleberries ripen in the high mountains, people from many villages of the Chopunnish Nation gathered in the Oyaip Prairie for the work and festivities of their annual camas1 harvest.

2 From far and near The People came. . . .

3 Should a stranger enter their homeland and ask, "Where are you from?" the reply was always, "We are Nee-mee-poo, The People who live here in this place."

4 It was a time of Lawtiwa- mah-ton—atime of being friends together—when The People came for this last chance to enjoy being together before the Cold Moons kept them close to their fires. The visiting and trading, the foot racing and horse racing, and the gambling and stick games would be remembered and talked about long after they had forgotten the drudgery of digging and roasting camas, picking berries, drying meat and fish. Lawtiwa- mah-ton! It was good to be friends together.

5 As was their custom since wahk-kee-ma, a time far back beyond the memory of man, they set up their camps in the same locations their parents and grandparents had occupied before them. Red Bear's people, from Kamiah, made their camp near the trail that came out of the mountains. Their neighbors in Kamiah Valley, The People from Tee- e- lap- a- lo, had their camp close by. Across the wide meadow, by the great roasting pits, the camps of the Te- wap-poo and Ask-kah-poo were located. The tepees and ish-nash, brush shelters, of other groups nestled in their accustomed areas in and among the pines in such numbers that they encircled the entire meadow land.

6 Red Bear's people had traveled all summer with neighboring bands, gathering and preparing roots, picking and drying berries, drying and smoking meat and fish for their winter food supply. Now they were at the Oyaip camp. The women worked hard to dig and cure as many bags of roots as they could during the warm, sunny days, for the sharp night air brought warnings that WARM was going and COLD was coming.

7 Everyone helped in some way. Most of the men fished or hunted for meat. While many of the women dug and roasted camas, other women and older children picked and dried berries.

8 And the younger children played. They played at hunting. They played with the babies. They played with their horses and puppies. They learned how to live through their play.

9 This sun, happiness, peace, and quiet blessed the Red Bear camp. All were busy with their daily tasks, until sudden cries came from the children playing by the trail.

---

1 **camas:** a wild, edible plant

10 "People coming! People coming! People coming on the trail from the high mountains!" they called as they ran to their elders, who looked sharply at the figures of approaching horsemen.

11 Were they friends or enemies? Did they bring good news or bad?

12 "Who can it be? What brings them here?" were the questions in every mind.

13 "Could they be the four hunters who had gone to Buffalo Country two summers past? Would they have news of the families who had gone long ago to Buffalo Country and never returned?"
14 It was customary for a hunting party to be gone for more than one season.

15 "Looks like hunters," the older men agreed. "Looks like they had good hunting. Maybe our four hunters. [They have] been gone many moons."
16 "Looks like five people—not four," others observed.

17 Excitement grew as the riders came close enough to be recognized.

18 "A-a-a-a-a, they are our four hunters! But who is the fifth person?" they asked.

19 "Looks like a woman. Who is she?"

20 The hunters rode up to the welcoming crowd, proud to show off the loads of meat, hides, and other trophies of their hunt. They paraded around the encampment for all to see how strong their Hunting Power had been— what great hunters they, themselves, were.

21 Red Bear's people rejoiced at their hunters' success. Good hunters brought good to everybody. The meat meant plenty of food and the hides meant soft- tanned robes to give comfort through the Cold Moons. But it was the sight of the frail figure of the woman that aroused their curiosity. Who was she? Where had she come from? . . .
22 "Belongs to Red Bear people. Gone then come back," the hunters said, as they dismounted and unloaded their packs. . . .
23 Now they could see! She was the daughter of the family gone so long ago! The girl-child who had left came back now— a grown woman.
24 "Wat-ku-ese!" the women cried. "Gone- from-Home-then-Come-Back. Wat-ku-ese!" And Wat-ku-ese was her name from that time on.
25 Gentle arms lifted Wat- ku-ese from her horse. The women brought her food and made a place for her to rest. For many suns they cared for her until she became stronger.
26 One evening Wat-ku-ese told her story for all to hear.

<mark>TAP TO START SHSAT PREP</mark>

24. Paragraph 1 contributes to the setting of the excerpt by establishing that

E. the story's location is a plentiful place that allows The People to enjoy a comfortable gathering.
F. the events in the story occurred in the past and are being remembered by The People.
G. the camp in the story is changing and that the changes are causing problems for The People.
H. the story's plot begins as The People are observing their land and what it offers them.

25. In paragraphs 4 and 6, the beginning of the change in seasons affects the characters mainly by

A. causing them to collect their bounty and feel eager to celebrate before it becomes cold.
B. making them want to rest and relax before the challenging work of the harvest begins.
C. forcing them to give up leisure time to prepare their camp for the coming winter.
D. allowing them to trade the goods they have prepared during the warm months.

26. How do paragraphs 7 and 9 convey a central idea of the excerpt?

E. by explaining that The People often explore different areas, which shows the value of trying new things
F. by revealing that The People must complete many tasks, which shows the necessity of being organized
G. by suggesting that The People are influenced by the weather, which shows their close relationship with nature
H. by demonstrating that The People work together, which shows the importance of contributing to the community

27. In paragraph 8, the author repeats the word "played" **most likely** to

A. emphasize how much the adults enjoy observing the children.
B. show how everyone finds a way to enjoy being at the gathering.
C. indicate the variety of activities available at the gathering.
D. characterize the manner in which the children master the work of adults.

Excerpt from "The Food Business Incubator"

by Mandalit Del Barco

1 "La Cocina" means "the kitchen" in Spanish. It's also the name of a business incubator1 based in San Francisco's Mission District. Since it began in 2005, it's been helping local food entrepreneurs, many of whom are low- income immigrant women, develop their small businesses.

2 Over the years, many of its alumni have found success: more than 50 chefs in its program have become self- sufficient business owners, and many of them have opened their own brick- and- mortar restaurants. Two alumnae of its culinary program . . . were even recognized as semi- finalists for prestigious James Beard awards.2

3 A new cookbook, *We Are La Cocina: Recipes in Pursuit of the American Dream*, tells some of their stories.

4 Executive director Caleb Zigas says the nonprofit La Cocina grew out of two grassroots economic development organizations3 who found many people cooking at their homes and selling food on the streets. The vendors needed an affordable commercial kitchen space and technical assistance in order for their businesses to be legally viable. La Cocina provided just such a space, in addition to helping them develop business plans, pull city permits and more.

5 Zigas says as many as eight businesses can work in the kitchen space at La Cocina at any one time. Some can prep for a farmers' market sale, corporate catering gigs or weddings, while others might be making and packaging their food products.

6 "It's just an incredible and exciting range of techniques, flavors, perspectives, age, language. And that's a really beautiful thing," he says. . . .

7 Twice a year, La Cocina hosts "F&B: Voices from the Kitchen," a storytelling project where their chefs can tell their own stories, as they do in the new cookbook. Some of the chefs will be on tour to promote the book, whose proceeds will go to support La Cocina entrepreneurs.

8 NPR4 caught up with . . . La Cocina chefs, who shared their stories:

Mariko Grady, Aedan Fermented Foods

9 At La Cocina, you can often hear Mariko Grady singing or humming as she prepares miso, *koji*, and *amasake*. Her fermented products come in four different flavors, including mushroom and chicken, to be used in soups and sauces. She originally brought the fermenting rice and barley

---

1 **business incubator:** company that helps new and startup companies develop by providing services such as management training and office space

2 **James Beard awards:** an award named after American cook and author James Beard, considered one of the highest honors in the culinary industry

3 **economic development organizations:** organizations whose mission is to promote economic improvement within a specific geographical area

4 **NPR:** National Public Radio, a nonprofit media organization that produces and distributes news and cultural programming

TAP TO START SHSAT PREP

koji seeds from Japan, where she had a 30- year career as a singer and dancer with the prestigious modern theatrical dance group she founded, Pappa Tarahumara. They performed around the world, and 16 years ago, had a one- night show in San Francisco. The man who would become her husband was in the audience. She soon joined him in San Francisco, often returning to Tokyo to rehearse. But after the earthquake and tsunami hit Japan in 2011, her company disbanded. . . . Grady focused on nourishing her family and creating a line of fermented products that she sells online, at local Bay Area stores and at the Ferry Plaza Farmers Market. She began at La Cocina in 2012 and named her business after her son, Aedan. (Written in Kanji characters, the name means "wisdom" and "handed down from generation to generation.") . . . Her fermented products are "also full of wisdom about how to relate to nature and how to create a healthy life," she says. . . .

Shani Jones, Peaches Patties

10 Shani Jones is a native San Franciscan. Her father was born in New Orleans, her mother, in Jamaica. She says their home was always filled with a variety of spices and dishes like jerk chicken and Jamaican patties— savory pastries filled with beef or chicken. Jones says she learned to cook from her mother, whose nickname was Peaches. After returning from college in Atlanta, Jones worked on her doctorate in organizational leadership and management while driving a Lyft5 car. She often told passengers about her idea of opening a catering company with her mom's recipes. They steered her to La Cocina, where she developed her own business, named after her mother. Five years later, she caters and runs a kiosk6 at a small food cooperative in Bernal Heights, where some of her handmade patties have an Ethiopian twist, "because my husband is Ethiopian." Jones has big aspirations for Peaches Patties: "The ultimate goal," she says, "is to be the patty kingpin7 of the West Coast."

==TAP TO START SHSAT PREP==

5 **Lyft:** ride-sharing company where people use their own cars to provide rides to customers

6 **kiosk:** cart or small structure with one or more open sides that is used to vend merchandise or

services

7 **kingpin:** the leader in a group or undertaking

Level of Income	La Cocina considers assets and access to opportunity when screening applicants. La Cocina's mission is to support entrepreneurs who face barriers to becoming successful in the food industry. Applicants must be classified as low- or very- low- income earners according to the Housing and Urban Development (HUD) Guidelines for San Francisco.
Business Plan	Applicants must have a business plan that is ready to be put into action. La Cocina will help applicants refine an existing business plan. Applicants without a business plan should contact one of La Cocina's partner organizations for guidance in developing one.
Viable Product	The applicant's food must not only be delicious but also stand out. For a business to make a profit, there also has to be a market for the food.
Entrepreneurial Work Ethic	La Cocina is excited to work with entrepreneurs who are motivated and passionate about growing their business. Succeeding in the food industry requires a lot of heart and hard work.
Community Spirit	The 30+ entrepreneurs who share La Cocina's kitchen are from many different backgrounds. La Cocina values the community it has created and expects each entrepreneur to be active in bringing the spirit of La Cocina to the wider world. In order to succeed in the La Cocina kitchen, accepted applicants must be flexible and willing to work closely with others.

Source: La Cocina

31. Read this sentence from paragraph 2.

Two alumnae of its culinary program . . . were even recognized as semi-f inalists for prestigious James Beard awards.

The words "recognized" and "prestigious" in the sentence convey that La Cocina

A. makes an effort to identify chefs who have a strong entrepreneurial work ethic.
B. has the ability to mentor chefs to reach the highest levels of achievement in their craft.
C. is focused on establishing local food entrepreneurs as celebrated professionals in their industry.
D. is dedicated to assisting chefs in developing new and innovative products.

32. Paragraph 4 contributes to the development of ideas about La Cocina in paragraph 1 by

E. specifying how La Cocina helps local food entrepreneurs become successful.
F. explaining what kind of goals La Cocina tries to set for local food entrepreneurs.
G. providing background information about local food entrepreneurs in San Francisco.
H. describing how Caleb Zigas discovered the need to provide assistance to local food entrepreneurs.

33. The description of Mariko Grady's background in paragraph 9 contributes to a central idea in the excerpt by

A. demonstrating what people are looking for when they come to La Cocina.
B. explaining why La Cocina is the best option for people starting out in the food business.
C. showing how La Cocina can help people find success in the food business even though they have a background in something different.
D. confirming that La Cocina was originally established for small business owners who are looking to expand their services.

34. Which statement would the author **most likely** agree with?

E. The publicity efforts La Cocina engages in will help its business design spread to other cities.
F. The variety of exciting food available in San Francisco is due to the work of La Cocina.
G. La Cocina offers a method that will guarantee business ownership for qualified entrepreneurs.
H. La Cocina does admirable work in supporting the efforts of ambitious cooks who may have few resources.

TAP TO START SHSAT PREP

One prize was awarded each week in a two-week contest. The prizes were a trip to Disney World, a big-screen television, and a computer.

1) Luis, Michael, and Nadia each won a prize.
2) Michael did not win the computer.

Which of the following pieces of additional information makes it possible to determine who won each prize?

A. Michael won the free trip.
B. Luis won the television.
C. Luis won the computer.
D. Nadia won the computer.
E. Michael won the television.

15. When Sue listens to music, she also dances. Whenever she dances, she also sings.

Based only on the information above, which of the following is a valid conclusion?

F. When Sue listens to music, she does not sing.
G. Sue listens to music while she dances.
H. When Sue sings or dances, then she is also singing.
J. If Sue listens to music, then she sings.
K. If Sue is not dancing, then she is not singing.

17. At Midway School, each new student is paired with an older student partner. The new students are Sue, Gloria, Sandro, and Henry. The older student partners are Edgar, Paula, Rakim, and Whitney.

1) Sandro and Whitney are paired.
2) Sue is not paired with Rakim.
3) Edgar is not paired with Gloria or Sue.

Who is paired with Paula?

A. Sue
B. Gloria
C. Henry
D. Edgar
E. Rakim

18. Jack played three instruments in the orchestra. He played violin for two years, cello for three years, and bass for three years. He never played more than two instruments during the same year. The first year, Jack played only the violin.

What is the **least** number of years Jack could have played in the orchestra?

F. 4
G. 5
H. 6
J. 7
K. 8

Questions 19 and 20 refer to the following information.

In the code below, (1) each letter always represents the same word, (2) each word is represented by only one letter, and (3) in any given example, the letters are scrambled.

[table of code words — illegible]

19. Which word is represented by the letter Q?

A. birds
B. planes
C. Michelle
D. paints
E. and

20. Which letter represents the word "paints"?

F. L
G. P
H. E
J. W
K. Cannot be determined from the information given.

13. A one-room school has three grades—6th, 7th, and 8th. Eight students attend the school: Ann, Bob, Carla, Doug, Ed, Filomena, George, and Heidi. In each grade there are either two or three students.

   1) Ann, Doug, and Filomena are all in different grades.
   2) Bob and Ed are both in the 7th grade.
   3) Heidi and Carla are in the same grade.

Based only on the information above, which of the following **must** be true?

A. Exactly two students are in the 6th grade.
B. Carla and Doug are in the same grade.
C. Exactly three students are in the 7th grade.
D. Bob and Ann are in the same grade.
E. [illegible]

14. Four bikes are parked in a bike rack.

   1) [illegible]
   2) The yellow bike is next to the red bike.
   3) The green bike is between the yellow bike and the blue bike.
   4) Paul's bike is between the blue bike and the red bike.

Based only on the information above, which of the following **must** be true?

F. Paul's bike is green.
G. The yellow bike is between the red bike and the green bike.
H. Paul's bike is yellow.
J. The red bike is next to the green bike.
K. The color of Paul's bike cannot be determined.

15. In the town of Honie, the millworkers are all over six feet tall. Every Honie millworker is good at math.

Based only on the information above, which of the following **must** be true?

A. At least some people in Honie who are over six feet tall are good at math.
B. At least some people in Honie who are good at math are not millworkers.
C. Anyone in Honie who is over six feet tall works at the mill.
D. Anyone in Honie who is good at math is over six feet tall.
E. Anyone in Honie who is good at math works at the mill.

16. [illegible intro]

   1) [illegible]
   2) [illegible]
   3) None of the houses with [illegible] is next to one another.
   4) No house has both a fenced yard and a porch.

Based only on the information above, which of the following **must** be true?

F. Houses L and R have porches.
G. House N has a porch.
H. House P has a porch.
J. Houses P and Q have fenced yards.
K. Either House M or House N has a fenced yard, but it is not possible to determine which one.

Excerpt from "The Past and the Future of the Earth's Oldest Trees"

by Alex Ross

1 About forty-five hundred years ago, not long after the completion of the Great Pyramid at Giza, a seed of *Pinus longaeva*, the Great Basin bristlecone pine, landed on a steep slope in what are now known as the White Mountains, in eastern California. The seed may have travelled there on a gust of wind, its flight aided by a winglike attachment to the nut. Or it could have been planted by a bird known as the Clark's nutcracker, which likes to hide pine seeds in caches; nutcrackers have phenomenal spatial[1] memory and can recall thousands of such caches. This seed, however, lay undisturbed. On a moist day in fall, or in the wake of melting snows in spring, a seedling appeared above ground— a stubby one- inch stem with a tuft of bright-green shoots.

2 Most seedlings die within a year; the mortality rate is more than ninety- nine percent. The survivors are sometimes seen growing in the shadow of a fallen tree. The landscape of the Ancient Bristlecone Pine Forest, as this area of the White Mountains is called, is littered with fragments of dead trees— trunks, limbs, roots, and smaller chunks. *Pinus longaeva* grows exclusively in subalpine regions of the Great Basin, which stretches from the eastern slopes of the Sierra Nevada to the Wasatch Range, in Utah. Conditions are generally too arid for the dead wood to rot; instead, it erodes, sanded down like rock. The remnants may harbor nutrients and fungi that help new trees grow. Bristlecones rise from the bones of their ancestors— a city within a cemetery.

3 Coast redwoods and giant sequoias, California's gargantuan world-record-holding trees, can grow fifty feet or more in their first twenty years. Bristlecones rise agonizingly slowly. After four or five years, the seedling on the steep slope would have been just a few inches higher, sprouting needles in place of the embryonic shoots. The needles are a deep green, tough, resinous, and closely bunched in groups of five. On a mature tree, they live for fifty years or more. Decades may have passed before the tree was human height, and decades more before it resembled a conventional pine. Bristlecone saplings grow straight up, with relatively sparse foliage, looking like undernourished Christmas trees. After a few hundred years— by which time the Old Kingdom of Egypt had fallen— it was probably forty or fifty feet in height.

4 Many tree species live for hundreds of years. A smaller but not inconsiderable number, including the sequoias and certain yews, oaks, cypresses, and junipers, survive for thousands. Once a bristlecone has established itself in the unforgiving conditions of the White Mountains, it can last almost indefinitely. The trees tend to grow some distance from one another, so fires almost never destroy an entire stand. Because only a few other plant species can handle the dry, cold climate, the bristlecones face little competition. Unlike most plants, they tolerate dolomite soil, which is composed of a chalky type of limestone that is heavily alkaline and low in nutrients. As for insect threats, bristlecone wood is so dense that mountain- pine beetles and other pests can rarely burrow their way into it.

5 Empires rose and fell; wars raged; . . . and the tree from 2500 B.C. continued its implacable slow-motion existence, adding about two- hundredths of an inch to the diameter of its trunk each

---

1 **spatial:** relating to physical space

year. Minute changes in the tree-ring record make bristlecones an exceptionally useful source of data about changing conditions on Earth. When rains are heavier than normal, the rings widen. When volcanic eruptions cause global cooling, frost rings make the anomaly**2** visible. . . .

6 As the millennia go by, bristlecones become contorted and wraithlike.**3** The main stem, or leader, dies back. Entire branches, even the trunk itself, become fossils. At first glance, the tree may look dead. Such is the case of the forty- five-hundred- year-old tree that clings to life near the tourist path that now runs through the Ancient Bristlecone Pine Forest. Spears of dead wood jut into the air. The trunk is a marbled hulk stripped of bark, like driftwood thrown from a vanished ocean. A ribbon of live bark runs up one side, funneling water and nutrients to clumps of green needles high above. All told, the tree is an unprepossessing specimen; most people march past it without giving it a second glance. . . .

7 . . . No two super- elderly trees look alike, to the point where they have acquired the characteristics of individuals. Trees are prone to anthropomorphism; we project our dreams and our anxieties onto them. Bristlecones have been called elders, sentinels, sages. The possibility that climate change will cause their extinction has inspired a spate**4** of alarmed news stories, although tree scientists tend to discount the idea that the bristlecones are in immediate danger. They have survived any number of catastrophes in the past; they may survive humanity.

---

2 anomaly: oddity
3 wraithlike: ghostly

4 spate: sudden abundance

37. What is the effect of comparing groups of bristlecone pines to "a city within a cemetery" (paragraph 2)?

A. It illustrates that the new tree's appearance is markedly different from that of mature bristlecone pines.
B. It emphasizes the new tree's ability to use resources left by prior generations of bristlecone pines.
C. It highlights the tree's capacity for a long life if it is able to survive to maturity.
D. It reveals that the tree's dense growth patterns are unusual in arid conditions.

TAP TO START SHSAT PREP

TAP TO GET FULL SHSAT MATERIALS & PREP

42. Throughout the excerpt, the author conveys his point of view mainly by

E. sharing details about the qualities of the bristlecone pine that make it an unusual tree.

F. comparing the bristlecone pine to global empires that lasted thousands of years before falling.

G. explaining the way the seemingly sickly appearance of the bristlecone pine contrasts with its ability to survive.

H. arguing that the bristlecone pine has survived past threats to its survival and will continue to thrive.

43. What is the **best** summary of the bristlecone pine's life cycle?

A. The bristlecone pine takes root as a stubby seedling in the mountains. Over time, it grows slowly in a hostile environment with alkaline soil that ensures little competition from other trees.

B. The bristlecone pine grows up slowly from the fragments of its dead ancestors. Over time, it begins to become contorted in appearance but continues to funnel water and nutrients to its stem.

C. The bristlecone pine grows slowly in an environment hostile to other trees. Over time, its trunk and some branches fossilize, but it funnels water and nutrients to other parts that are still alive.

D. The bristlecone pine grows only in one location in the mountains. Over time, it develops sparse foliage that fossilizes slowly, but the trunk and branches stay alive as revealed by ribbons of live bark.

Bird Talk

by Carl Sandburg

And now when the branches were beginning to be heavy,

It was the time when they once had said, "This is the
beginning of summer."
The shrilling of the frogs was not so shrill as in the
5 first weeks after the broken winter;
The birds took their hops and zigzags a little more
anxious; a home is a home; worms are worms.
The yellow spreads of the dandelions and buttercups
reached across the green pastures.
10 *Tee whee* and *tee whee* came on the breezes, and the grackles
chuzzled their syllables.
And it was the leaves with a strong soft wind over them
that talked most of all and said more than any others
though speaking the fewest words.
15 It was the green leaves trickling out the gaunt nowhere
of winter, out on the gray hungry branches—
It was the leaves on the branches, beginning to be heavy,
who said as they said one time before, "This is the be-
ginning of summer."

20 We shall never blame the birds who come

where the river and the road make the Grand Crossing
and talk there, sitting in circles talking bird talk.
If they ask in their circles as to who is here
and as to who is not here and who used to be here,
25 Or if instead of counting up last year as against
this year, they count up this year as against next
year, and have their bird chatter about who is here
this year who won't be here next year,
We shall never blame the birds.

30 If I have put your face among leaf faces, child,

Or if I have put your voice among bird voices,
Blame me no more than the bluejays.

TAP TO START SHSAT PREP

47. Which lines from the poem **best** contrast with the idea of winter's scarcity and bleakness?

A. "The shrilling of the frogs was not so shrill as in the / first weeks after the broken winter;"
(lines 4–5)
B. "The yellow spreads of the dandelions and buttercups / reached across the green pastures."
(lines 8–9)
C. "*Tee whee* and *tee whee* came on the breezes, and the grackles / chuzzled their syllables."
(lines 10–11)
D. "Or if instead of counting up last year as against / this year, they count up this year as
against next" (lines 25– 26)

48.   How do lines 23–28 contribute to a central idea of the poem?

        E. They suggest that the speaker is aware of what has been lost in the winter.
        F. They imply that the birds sing the most in the summer.
        G. They reveal that the birds are subject to the cycles of nature.
        H. They emphasize that the speaker enjoys observing nature.

49. Throughout the poem, the poet conveys the speaker's point of view by

A. gradually moving the speaker's attention from one element of nature to another.
B. providing the speaker's motivation for describing the landscape in great detail.
C. highlighting the speaker's emotional response as each season passes.
D. shifting the speaker's focus from external observations to personal reflection.

50. Over the course of the poem, a central idea is developed mainly through the speaker's

E. sense of eager anticipation as winter ends.
F. description of the changes in nature as the seasons transition.
G. observation of the birds' behavior as summer begins.
H. prediction of future alterations in the physical landscape.

TAP TO START SHSAT PREP

The author of this opinion article attended a symposium, or conference, in Missoula, Montana, at which biologists and other scientists discussed species of plants and animals that are not native to the areas in which they live.

Excerpt from "It's Time to Stop Thinking That All Non-Native Species Are Evil"

by Emma Marris

1 Invasive species are scary. It was ecologist Charles Elton, back in the 1950s, who introduced the militaristic "invasion" metaphor to describe exotic plants and animals— but there's no question some can be extremely destructive.

2 The brown tree snake has eaten a dozen kinds of forest birds in Guam to extinction; zebra mussels clog pipes around the Great Lakes; the common house cat turns out to be, in Australia, a mercilessly effective killer of cute, fluffy marsupials like the bilby and the numbat.

3 As scientists have sounded the alarm about these pests, the public has gotten the message. Citizen groups rip out non-native plants. Native gardens have become increasingly popular, both as ways to celebrate the unique flora of each region and as tiny hot spots of diversity. Native trees provide food for native bugs, which feed native birds. Food chains developed over thousands of years of co- evolution unfold in our backyards. . . .

4 So we've learned, scientists and laypeople alike, that native species are good and non-natives are bad.

5 Julian Olden, a biologist at the University of Washington, Seattle, who co- organized the symposium, recently polled nearly 2,000 ecologists. Among his findings: a substantial number of them said they would immediately eradicate a hypothetical non- native forest plant, even if it were shown to have no effect on the forest. Olden calls this the "guilty even when proven innocent" approach.

6 That kind of approach is not very useful on a rapidly changing planet.

Exotics Are Everywhere

7 Climate change is making it harder even to decide who the invaders are.

8 How, scientists at the symposium wondered, do you define "native" on a warming planet, when plants and animals are already moving toward the poles or up mountainsides in search of climate conditions they can tolerate? Should we consider them "invasive" in their new homes? Regardless of what we label them, conservationists will be reluctant to remove them from their new environs—to do so would stymie1 their chances of adapting to the warmer future we're creating.

9 And then there are the non-natives that we actually like. Most domestic crops are exotic in most of the places they're grown, but there are even wild exotics that "do good," forming useful relationships with native species.

---

[1] **stymie:** hinder or interfere with

10 Edwin Grosholz of the University of California, Davis, told the recent symposium about one such relationship. On beaches in his state, non-native spartina grass has become important habitat for the endangered California clapper rail, a plump shorebird with a downward curving bill more at home on land than in the air. A project to rip out and poison the spartina— which grows in dense swaths that exclude many other shorebirds— saw clapper rail numbers go tumbling downward.

11 There are other examples like that. The endangered southwestern willow flycatcher nests in "invasive" tamarisk shrubs. Many native (and beautiful) Hawaiian flowers are now pollinated by the Japanese white-eye bird— because the native pollinators have been driven extinct by other non-native species.

12 Should we impose further risk on already endangered natives by severing these relationships? Or should we admire the resilience of nature and let such "well- behaved" exotics stay? . . .

13 Leave them alone, more and more conservationists are arguing, and stop focusing obsessively on categorizing species as native or non- native. Mark Davis, an ecologist at Macalester College in St. Paul, Minnesota, once considered himself an "invasion biologist"— but not anymore. "I am actively trying to get the field to retire the invader narrative," he said in Missoula.

A Good Thing, Not the Only Thing

14 After all, nativeness is just one environmental value, and arguably not as important as preventing extinctions and preserving biodiversity. In some cases we can best serve biodiversity by leaving the non-natives alone or even— brace yourself, now— introducing them on purpose.

15 This is the thinking behind, for example, installing the Aldabra tortoise on the islands of Mauritius. The islands lost their own large tortoises, and the fruiting plants that formerly had their seeds moved around by these fruit- loving reptiles have been on the decline. A tortoise that's related to the island's large tortoises— a non-native from the Seychelles in the Indian Ocean that was intentionally introduced in 2004— is now handling some of that work.

16 Most of the time, for the time being, conserving species still means focusing on supporting them in their historical habitats, planting natives and removing non- natives. We can and should do that in places where it is feasible and important to us.

TAP TO START SHSAT PREP

POSSIBLE MANAGEMENT OF NON-NATIVE SPECIES, BASED ON EXTENT OF INVASION
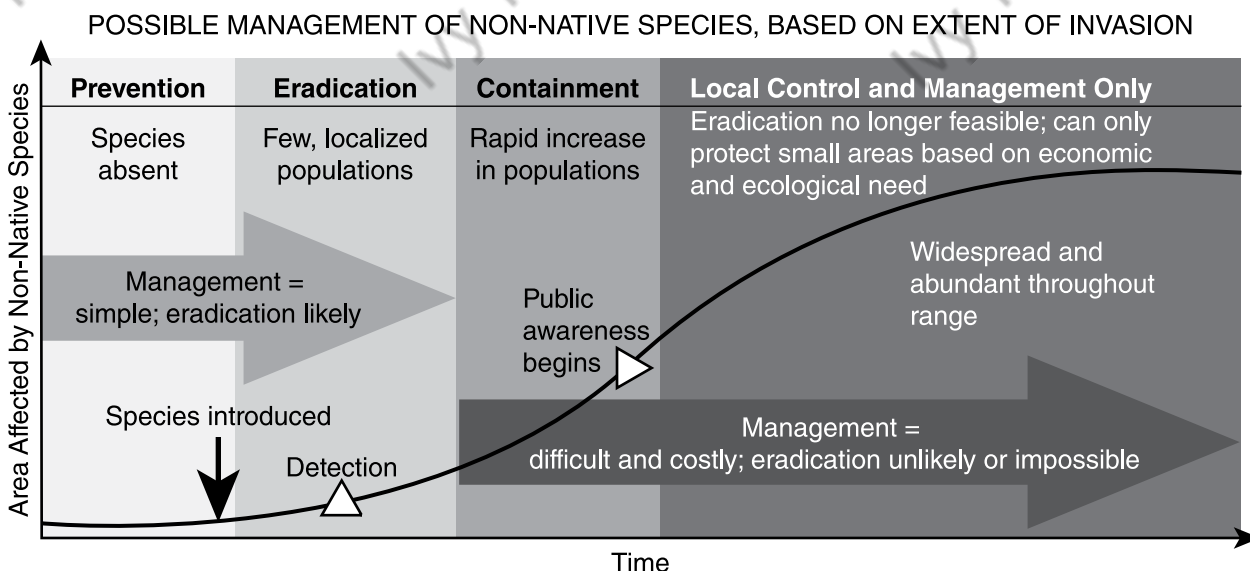
51. Which sentence from the excerpt supports the conclusion that Elton's "militaristic 'invasion' metaphor" (paragraph 1) has influenced scientific understanding of non- native species?

A. "Among [Olden's] findings: a substantial number of them said they would immediately eradicate a hypothetical non- native forest plant, even if it were shown to have no effect on the forest." (paragraph 5)

B. "Regardless of what we label them, conservationists will be reluctant to remove them from their new environs— to do so would stymie their chances of adapting to the warmer future we're creating." (paragraph 8)

C. "A project to rip out and poison the spartina— which grows in dense swaths that exclude many other shorebirds— saw clapper rail numbers go tumbling downward." (paragraph 10)

D. "In some cases we can best serve biodiversity by leaving the non- natives alone or even— brace yourself, now— introducing them on purpose." (paragraph 14)

52. Climate change has affected efforts to manage invasive species mainly by causing ecologists to

E. call upon the public to be more tolerant of the presence of non- native species.

F. admit that past attempts to eliminate non- native species have damaged the environment.

G. find ways of ensuring that native species are not harmed by the arrival of new species.

H. acknowledge that it is not realistic for some species to remain in their native habitats.

53. Which detail provides the **most** relevant support for the claim that "climate change is making it harder even to decide who the invaders are" (paragraph 7)?

A. the mention in paragraph 8 of non-native species that are forced to seek new habitats
B. the acknowledgment in paragraph 9 that non-native species include many domestic crops
C. the description in paragraph 11 of the interactions between native and non- native species
D. the account in paragraph 13 of an ecologist who changed his beliefs about non-native species

54.   The author's use of cause and effect in paragraphs 10– 11 mainly emphasizes the idea that

E. some non-native species have helped their environments while others have had harmful impacts.
F. attempts to remove non- native species have seldom produced desired results.
G. some endangered native species have flourished because of the presence of non-native species.
H. interactions between endangered native species and non- native species must be carefully monitored.

55. Which sentence from the excerpt supports the idea that some species are able to adjust to change?

A. "Native gardens have become increasingly popular, both as ways to celebrate the unique flora of each region and as tiny hot spots of diversity." (paragraph 3)
B. "Many native (and beautiful) Hawaiian flowers are now pollinated by the Japanese white- eye bird— because the native pollinators have been driven extinct by other non- native species." (paragraph 11)
C. "After all, nativeness is just one environmental value, and arguably not as important as preventing extinctions and preserving biodiversity." (paragraph 14)
D. "The islands lost their own large tortoises, and the fruiting plants that formerly had their seeds moved around by these fruit- loving reptiles have been on the decline." (paragraph 15)

Part 2 — Mathematics

57 Questions

IMPORTANT NOTES

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

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

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

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

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

GRID-IN QUESTION NOTES

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

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

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

CONTINUE TO THE NEXT PAGE ▶

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. The figure below shows a circle with a hole in the middle. The outer diameter of the circle is $1\frac{1}{4}$ inches. The diameter of the hole is $\frac{1}{4}$ inch.

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

$1\frac{1}{4}$ in.
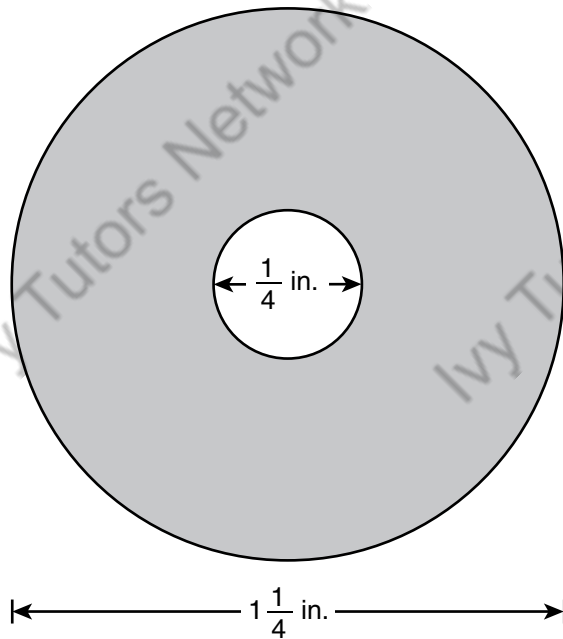
What is the area of the shaded region, to the nearest hundredth of a square inch?

59. A homeowner has a budget of $135 for the installation of a light fixture. An electrician charges $60 per hour plus a one-time trip charge of $45. What is the **greatest** amount of time, in hours, the electrician can work on the installation while staying within the homeowner's budget? Write your answer as a decimal.

---

60. The list shows the daily low temperatures in a city during six days in the winter.

$$7° \text{ F, } 4° \text{ F, } 1° \text{ F, } {}^-2° \text{ F, } {}^-5° \text{ F, } 3° \text{ F}$$

What is the difference between the lowest and highest temperatures, in degrees Fahrenheit, for the six days?

TAP TO START SHSAT PREP

61. A grocery store sells 1-gallon containers of milk for $3.99. The store also sells orange juice in a 6-pack of 5.5-fluid-ounce bottles for $1.79. Suppose the store wants to sell its orange juice in gallon containers instead. To the nearest dollar, how much more would a gallon of orange juice cost than a gallon of milk?

62.

MONTHLY HIGH TEMPERATURES
IN NEW YORK

36 40 44 48 52 56 60 64 68 72 76 80 84 88
Temperature (°F)
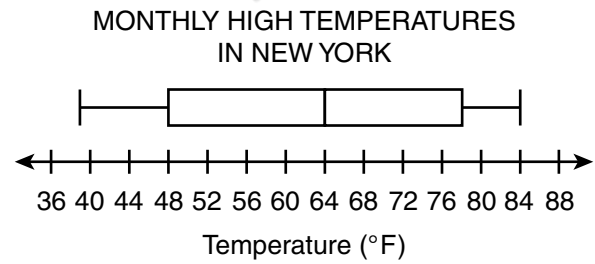
The box plot shows the average monthly high temperatures in New York City for 12 months. What is the difference between the range and the interquartile range of the temperature data?

Multiple Choice Questions

Questions 63–114

DIRECTIONS: Solve each problem. Select the 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. What is the prime factorization of 756?

    A. $2^2 \cdot 3^2 \cdot 21$

    B. $2^2 \cdot 3 \cdot 7 \cdot 9$

    C. $2^2 \cdot 7 \cdot 27$

    D. $2^2 \cdot 3^3 \cdot 7$

64.
$$\frac{x^2 y^6}{x y^2}$$

What is the value of the expression above if $x = {}^-2$ and $y = 2$?

    E. $^-64$

    F. $^-32$

    G. 16

    H. 32

65. If $(8 \div m) + 4 = 20$, what is the value of m?

    A. $\dfrac{1}{3}$

    B. $\dfrac{1}{2}$

    C. 2

    D. 3

66.
$$6x = x - 1{,}680$$

What is the value of x in the equation shown above?

    E. 336

    F. 240

    G. $^-240$

    H. $^-336$

67. A person buys a used car with a down payment of $1,200 and makes monthly payments of $275 for 3 years. What is the total amount the person pays for the car?

A. $2,025
B. $9,900
C. $11,100
D. $13,500

68.
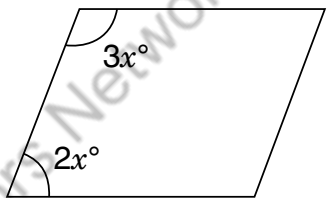
In the parallelogram above, what is the value of x?

E. 36
F. 18
G. 6
H. 5

69. A bus begins its trip with R occupants (including the driver). At each of the 20 stops, 3 people get on and no one leaves. If there are 3 times as many bus occupants at the end of the 20th stop as there are at the end of the 4th stop, how many occupants did the bus have immediately after the 10th stop?

A. 12
B. 24
C. 30
D. 42

70. Jay sold n tickets. Pilar sold three times as many tickets as Jay did. Together, Jay and Pilar sold ten more tickets than Amie sold. Which expression shows how many tickets Amie sold?

E. $10 - 4n$

F. $3n^2 + 10$

G. $4n + 10$

H. $4n - 10$

115.

SERVINGS OF FRUITS AND VEGETABLES

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

There are 20 students in a class. The frequency table shows the number of students who ate a certain number of servings of fruits and vegetables. What is the mean number of servings of fruits and vegetables eaten by a student in this class?

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

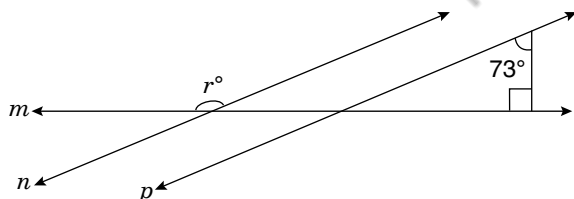B. 2

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

D. 4

116. A paste is made by mixing the following ingredients by weight: 4 parts powder, 3 parts water, 2 parts resin, and 1 part hardener. One billboard requires 6 pounds of this paste. How many total pounds of resin are required for 4 billboards?

E. 4 lb.

F. 6 lb.

G. 24 lb.

H. 48 lb.

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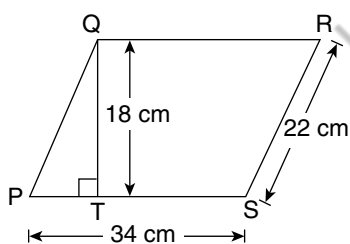INCOMPLETE ERASURES ON YOUR
ANSWER SHEET. ■

75.

In the figure above, $n \parallel p$. Straight line m intersects both line n and line p. What is the value of r?

A. 17
B. 117
C. 163
D. 173

76.

On parallelogram PQRS above, the length of $\overline{QT}$ is 18 centimeters. What is the area of the parallelogram?

E. 112 sq cm
F. 396 sq cm
G. 612 sq cm
H. 748 sq cm

77. Allison has 5 stamp albums with 576 stamps in each album. If she transfers her stamp collection to 6 albums, each holding 378 stamps, how many stamps will be left over?

A. 198
B. 612
C. 620
D. 632

78. Start with the number 135.28 and perform the following steps in order:

- Step 1: Multiply by 10.
- Step 2: Add 0.5 to the result of Step 1.
- Step 3: Drop the digits after the decimal point.
- Step 4: Divide by 10.

What is the result?

E. 13.5
F. 135
G. 135.2
H. 135.3

79. If $x = {}^-2$, what is the value of $\left|x + x^2 + x^3\right| - \left|x + 2x + 3x\right|$?

A. ${}^-18$

B. ${}^-6$

C. ${}^-2$

D. 2

---

80. $\dfrac{3 + (-3)}{3 - (-3)} =$

E. ${}^-1$

F. 0

G. $\dfrac{1}{6}$

H. 1

---

81. $12.96 \div 0.08 =$

A. 1.62

B. 16.2

C. 162

D. 1,620

82.
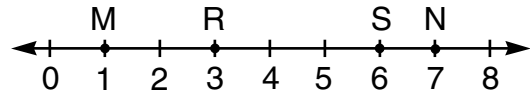
What is the distance between the midpoints of $\overline{MN}$ and $\overline{RS}$?

E. $\dfrac{1}{2}$ unit

F. 1 unit

G. $1\dfrac{1}{2}$ units

H. 2 units

83.

I. $s - t$
II. st^2
III. s^t

If s is a positive integer and t is a negative integer, which of the above expressions **must** be a positive number?

A. II only

B. I and II only

C. II and III only

D. I, II, and III

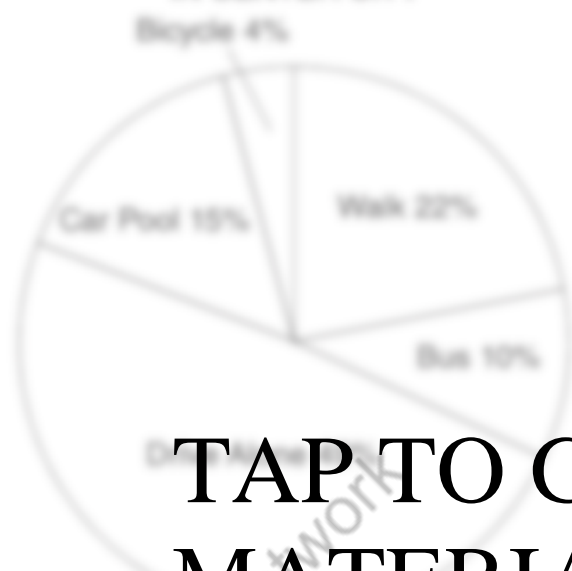## HOW PEOPLE GET TO WORK IN CENTER CITY

Bicycle 4%

Car Pool 15%

Walk 22%

Bus 10%

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. 1,800
D. 2,000

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

E. 20
F. 31
G. 39
H. 44

[?] In a scale drawing of a triangular banner, one side measures [?] 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

[?] 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?

[?] 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. $15\frac{2}{5}$

87. In a fruit basket, the ratio of apples to oranges is the same as the ratio of cherries to walnuts. If there are 6 oranges, 16 cherries, and 48 walnuts, how many apples are there?

 A. 2
 B. 3
 C. 18
 D. 38

88. In a showing of an artist's works, the ratio of the number of paintings, drawings, and photographs shown is 3:5:4, respectively. If the number of drawings shown was 45, what is the total number of photographs and paintings that were shown?
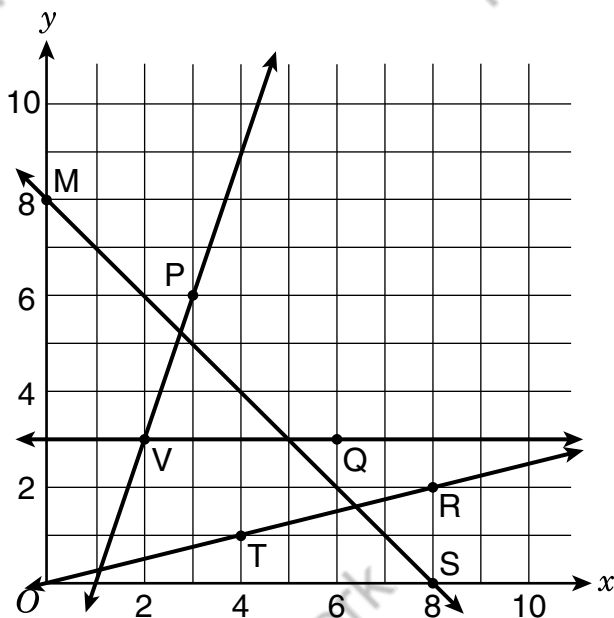
 E. 36
 F. 63
 G. 84
 H. 108

89. For each $\frac{3}{8}$ foot of curtain width, $\frac{5}{6}$ yard of fabric is needed to make ruffles. How many yards of fabric are needed per foot of curtain width?

 A. $\frac{5}{16}$ yd

 B. $\frac{29}{24}$ yd

 C. $\frac{20}{9}$ yd

 D. $\frac{7}{2}$ yd

90.

Which straight line is the graph of a proportional relationship?

E. $\overleftrightarrow{MS}$

F. $\overleftrightarrow{VP}$

G. $\overleftrightarrow{VQ}$

H. $\overleftrightarrow{TR}$

91.
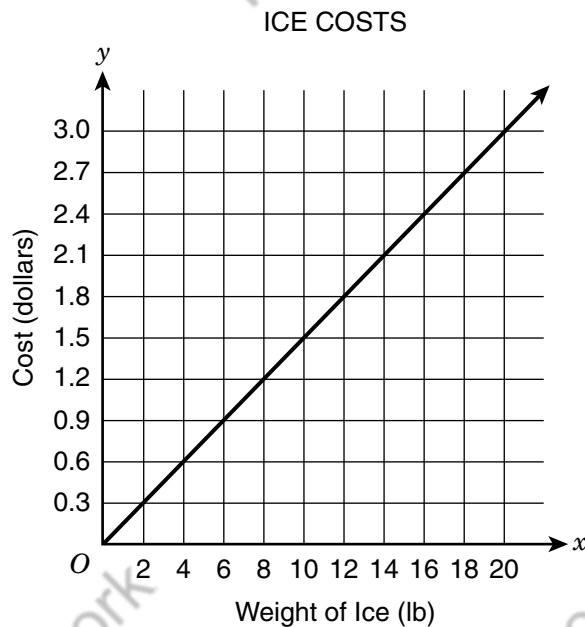
ICE COSTS

Some friends are buying bags of ice for a picnic. The graph shows the cost of the ice, in dollars, in relation to the weight, in pounds. Which statement about a point on the graph is true?

A. The point (20, 3) means that 3 lb of ice costs $20.00.

B. The point (1, 0.15) means that 1 bag of ice costs $0.15.

C. The point (10, 1.5) means that 10 lb of ice costs $1.50.

D. The point (0, 0) means that 0 lb of ice will be needed if 0 people go to the picnic.

SCORES ON BIOLOGY TEST

Section	Lowest Score	Range
I	66	28
II	62	26
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?

TAP TO GET FULL SHSAT MATERIALS & PREP

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

A. 2
B. 3
C. 4
D. 5

105. $\frac{32}{13} = 4.769230$

In the infinitely repeating decimal above, 7 is the first digit in the repeating pattern. What is the 201st digit?

A. 9
B. 2
C. 6
D. 7

103. 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. 13,820
H. 13,695

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

A. 321
B. 100

106. A container of balls contains 7 yellow, 8 white, and 12 green. If one ball is picked from the container at random, what is the probability that it will be yellow?

E. $\frac{1}{27}$

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

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

H. $\frac{3}{28}$

95. Out of 2,000 high school seniors, 191 were enrolled in the Honor Society. What percentage of the entire group of 2,000 seniors were in the Honor Society?

A. 0.955%
B. 1.91%
C. 9.55%
D. 19.1%

96.

NUMBER OF VISITORS TO BROOKSIDE ZOO

	Male	Female
Children	360	340
Adults	210	290

The table above shows the number of people who visited Brookside Zoo in one day. The largest of the four groups made up what percentage of all visitors on that day?

E. 30%
F. 28%
G. 24%
H. 17%

97. A bag contains 40 tiles that are either red, green, or blue. A tile is selected at random, the color is recorded, and the tile is put back in the bag. This process is carried out 120 times, and 18 of those times a red tile is selected. Based on the information, what is the most likely number of red tiles in the bag?

A. 6
B. 15
C. 18
D. 30

98.

LAST YEAR'S TOTAL ATTENDANCE

Attendees	Number
Children	1,750
Adults	2,250
Seniors	1,000
Total	5,000

If 100 individuals will attend the museum next week, what is the best estimate (based on last year's attendance) of the number of children who will be in that group?

E. 30
F. 34
G. 35
H. 50

99. A teacher will randomly select 3 students to be on a school committee. He will choose either a student from Classroom A or a student from Classroom B with each selection. This tree diagram shows the selection possibilities.
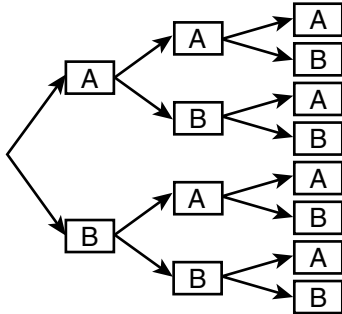
What is the probability that the teacher will select 2 students from Classroom A and 1 student from Classroom B (in any order) for the committee?

A. $\dfrac{1}{8}$

B. $\dfrac{3}{8}$

C. $\dfrac{1}{2}$

D. $\dfrac{3}{4}$

100. A bag contains 15 marbles: 11 blue marbles and 4 red marbles. Sarah picks one marble randomly, returns it to the bag, and then randomly picks one marble again. What is the probability that she picks a red marble **both** times?

E. $\dfrac{16}{225}$

F. $\dfrac{16}{121}$

G. $\dfrac{8}{15}$

H. $\dfrac{121}{225}$

SERVINGS OF FRUITS AND VEGETABLES

Number of Servings of Fruits and Vegetables	Number of Students
0	6
1	7
2	8
3	6
4	5
5	1

A.

B. 2

C. $3\frac{1}{2}$

D. 4

134. A paste is made by mixing the following ingredients by weight: 4 parts powder, 3 parts water, 2 parts resin, and 1 part hardener. One billboard requires 60 pounds of this paste. How many total pounds of resin are required for 4 billboards?

E. 6 lb

F. 8 lb

G. 24 lb

H. 48 lb

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

107. Nadia paid $1.00 to mail a letter. The cost to mail a letter is $0.55 for the first ounce of weight plus $0.15 for each additional ounce. What was the weight, in ounces, of the letter Nadia mailed?

A. 1.4
B. 1.5
C. 3
D. 4

108.

COST OF ORANGES

Number of Oranges	Cost
4	$1.80
6	$2.70
9	$4.05

The table shows the cost of oranges. What is the unit rate for the cost per orange?

E. $0.45
F. $0.90
G. $1.35
H. $1.80

109. A softball player bought bottles of water for her team to have at practice. The total number of bottles she bought, b, is proportional to n, the number of players at practice. Which equation represents the relationship between b and n? The constant of proportionality is p.

A. $b = pn$

B. $b = p + n$

C. $b + n = p$

D. $b + n + p = 1$

110. Malik earns $10 per hour at his job. He wants to change to a job that will pay $12 per hour. What will be the percent increase in Malik's hourly pay if he makes this job change?

E. 2%
F. 20%
G. 83%
H. 120%

113. Which table shows a proportional relationship?

A.

x	y
0	0
4	$\frac{3}{2}$
8	3

B.

x	y
0	1
4	$\frac{7}{2}$
8	6

C.

x	y
0	−1
4	$-\frac{1}{2}$
8	0

D.

x	y
0	0
4	12
8	16

114. Terry wants to pour cement around the edge of the circular patio in her backyard. The patio has a radius of 5 feet. What is the distance, in feet, around the edge of the patio? Use 3.14 for π.

E. 15.7
F. 31.4
G. 49.3
H. 78.5

TAP TO START SHSAT PREP

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. ∎