
# The following test was taken from the 2016-2017 Specialized High Schools Student handbook

# Sample Test, Form A
# Part 1 — Verbal

*Suggested Time — 75 Minutes*

45 QUESTIONS

## Scrambled Paragraphs

PARAGRAPHS 1-5

**DIRECTIONS:** In this section, arrange each group of sentences to create the best paragraph. The first sentence for each paragraph is given; the remaining five sentences are listed in random order. Choose the order for these five sentences that will create the **best** paragraph, one that is well-organized, logical, and grammatically correct. Each correctly ordered paragraph is worth **double** the value of a question in any other section of the test. No credit will be given for responses that are only partially correct.

To keep track of your sentence order, use the blanks to the left of the sentences. For example, write "2" next to the sentence you think follows the first sentence, write "3" next to the sentence you think follows "2," and so on. You may change these numbers if you decide on a different order. When you are satisfied with your sentence order, mark your choices on your answer sheet.

**Paragraph 1**

The Codex Mendoza is a fascinating document describing the culture and traditions of the Aztec Indians before the Spanish conquest.

_____ **Q.** A boy was often named for the date of his birth or for an animal or ancestor, or even for some event at the time of his birth.

_____ **R.** The parents would also place in the child's hands the implements that he or she would use in adult life, gently guiding them in the motions of use.

_____ **S.** Instruments used to weave and spin were given to the girls, while tools and weapons were given to the boys.

_____ **T.** One tradition it describes is the feast hosted by the parents of a newborn child to give that child a name.

_____ **U.** Girls' names, on the other hand, were frequently created to include the Aztec word for flower, *xóchitl*.

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**Paragraph 2**

In the remote mountain country of Nepal, a small band of "honey hunters" carry out a tradition so ancient that it is depicted in drawings dating back 10,000 years.

_____ **Q.** Throughout this entire dangerous practice, the hunter is stung repeatedly.

_____ **R.** To harvest the honey from these combs, a honey hunter climbs above the nest, lowers a bamboo-fiber ladder over the cliff, and climbs down.

_____ **S.** The honeybees that colonize the Nepalese mountainsides are among the largest in the world, building huge honeycombs on sheer rock faces that may be hundreds of feet high.

_____ **T.** Only veteran honey hunters, with skin that has been toughened over the years, can return from a hunt without the painful swelling caused by these stings.

_____ **U.** Once he has reached the level of the nest, the hunter uses two sturdy bamboo poles like huge chopsticks to pull it away from the mountainside and into a large basket, which is then lowered to people waiting below.

**Paragraph 3**

When contemporary Native American tribes meet for a powwow, one of the most popular ceremonies is the women's jingle dress dance.

_____ **Q.** During this type of dance, the dancers blend complicated footwork with a series of gentle hops, done in rhythm to a drumbeat.

_____ **R.** In the past, it is believed, the dress worn by the jingle-dress dancer was adorned by shells.

_____ **S.** These actions cause decorations sewn on the dancer's dress to strike each other as she performs, creating a lovely jingling sound.

_____ **T.** Besides being more readily available than shells, the lids are thought to create a softer, more subtle sound.

_____ **U.** The modern jingle dress no longer has shells, but is decorated with rows of tin cones, made from the lids of snuff cans, rolled up and sewn onto the dress.

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**Paragraph 4**

In the 1880s, John Wesley Powell, an explorer of the Grand Canyon and director of the United States Geological Survey, led the development of the first topographical maps of the entire United States.

_____ **Q.** This is because streams cut into the land, so contour lines will turn upstream, cross the waterway, and return downstream, creating a V shape, with the "V" pointing upstream.

_____ **R.** Waterways, such as streams, are usually marked in blue on topo maps, but even if they were not, the presence of one could still be identified using contour lines.

_____ **S.** Contour lines indicate the slope of the land as well.

_____ **T.** If the lines are close together, the elevation is changing rapidly and the slope is steep, whereas widely spaced lines depict a gently sloping terrain.

_____ **U.** Also called "topo maps," these maps differ from others in using thin brown lines, called contour lines, to connect points of equal elevation.

**Paragraph 5**

Ancient people of the Mediterranean thought that volcanoes were caused by Vulcan, the Roman blacksmith god.

_____ **Q.** In the same park, Mauna Loa, at 28,000 feet above the ocean's floor, is the largest active volcano in the world.

_____ **R.** There are dozens of active and potentially active volcanoes within the United States, including Kilauea, the most active volcano in the world.

_____ **S.** Both of these are shield volcanoes, which means that they were formed as lava flowed in all directions from a central vent to form low, gently sloping mountains.

_____ **T.** Volcanoes, which were named for Vulcan, are vents in the crust of the earth from which molten lava and ash erupt.

_____ **U.** That volcano, located in Hawaii Volcanoes National Park, has been spewing lava since 1983.

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# LOGICAL REASONING

QUESTIONS 11-20

**DIRECTIONS:** Read the information given and choose the **best** answer to each question. Base your answer **only on the information given.**

In a logical reasoning test, certain words must be read with caution. For example, "The red house is **between** the yellow and blue houses" does not necessarily mean "The red house is **between and next to** the yellow and blue houses"; one or more other houses may separate the red house from the yellow house or from the blue house. This precaution also applies to words such as **above, below, before, after, ahead of,** and **behind.**

**11.** The shortest member of the basketball team is 5 feet 11 inches tall. Cheng is 6 feet 2 inches tall.

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

**A.** Only members of the basketball team are taller than 5 feet 11 inches.
**B.** Cheng is shorter than some members of the basketball team.
**C.** At least one member of the basketball team is shorter than Cheng.
**D.** Cheng is a member of the basketball team.
**E.** Cheng is the tallest member of the basketball team.

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**12.** Javon has three pets at home: a hamster, which is active only at night; a dog, which is active only during the day; and a cat, which alternately sleeps for an hour and then is active for an hour.

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

**F.** The hamster and the cat will never be active at the same time.
**G.** The dog and the cat will never be active at the same time.
**H.** There are times when none of the pets is active.
**J.** All three animals are active at alternate hours.
**K.** There never will be more than two pets active at the same time.

**13.** There are four towns in Jefferson County: Elmont, Richland, Lendle, and Mopley. Highway 14 is closed from Elmont to Richland because of flooding.

1) Lendle is between Elmont and Richland on Highway 14.
2) Mopley can be reached from Lendle, without going through Elmont or Richland.

Which of the following statements is a valid conclusion from the statements above?

**A.** Mopley is not flooded.
**B.** Either Elmont or Richland is flooded.
**C.** Both Elmont and Richland are flooded.
**D.** No one can drive to Lendle on Highway 14.
**E.** Mopley cannot be reached directly from Elmont.

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**14.** Six people are seated at a six-sided table, facing inward, one at each side.

1) Jorge sits directly across from Bree.
2) Susana sits directly across from Michael.
3) Darius sits directly across from Lucy.
4) Bree is immediately next to Darius, on his right.
5) Susana is immediately next to Jorge.

Who sits on Michael's immediate left?

**F.** Susana
**G.** Bree
**H.** Lucy
**J.** Darius
**K.** Cannot be determined from the information given.

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**15.** One prize was awarded each week in a three-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.

**16.** When Soon Bae 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 Soon Bae sings, then she is dancing.
**G.** Soon Bae sings only when she is dancing.
**H.** When Soon Bae listens to music, then she is also singing.
**J.** If Soon Bae is not listening to music, then she is not dancing.
**K.** If Soon Bae 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 Bai, Gloria, Sandro, and Henry. The older student partners are Edgar, Paola, Rakim, and Whitney.

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

Who is paired with Paola?

**A.** Bai
**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 sentence, the letters may or may not be presented in the same order as the words.

| | | | | | |
|---|---|---|---|---|---|
| L | W | Q | P | R | means |
| "Michelle | paints | planes | and | birds." | |
| Z | V | R | U | N | means |
| "Stuart | draws | cars | and | dogs." | |
| L | V | P | T | R | means |
| "Javier | paints | cars | and | planes." | |
| Y | X | R | N | W | means |
| "Ivan | draws | birds | and | ships." | |

**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.** R
**J.** W
**K.** Cannot be determined from the information given.

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# READING

QUESTIONS 21-50

**DIRECTIONS:** Read each passage below and answer the questions following it. Base your answers **on information contained only in the passage.** You may reread a passage if you need to. Mark the **best** answer for each question.

On Monday evening, September 26, 1960, seventy million Americans turned on their TV sets to view the first televised political debate in a campaign for the presidency of the United States. As of that date, it was by far the largest number ever to witness a political discussion. The novelty of the event drew even those with little or no interest in politics.

The candidates, Republican Vice President Richard M. Nixon and Democratic Senator John F. Kennedy, had agreed to face each other and the nation in four one-hour sessions that the press dubbed the "Great Debates." Many expected Vice President Nixon to win the debates easily. He was ahead in the newspaper polls, he was an experienced public speaker, and he had served as vice president for nearly eight years. Senator Kennedy was less well-known and, at forty-three, was the youngest man ever to run for president. Throughout the presidential race, his opponents criticized him for his relative youth and inexperience.

By mutual agreement, the first session was limited to domestic issues within the United States. Each candidate was given eight minutes to make his opening remarks. During the remainder of the hour, the candidates took turns responding to questions posed by selected reporters. Both Kennedy and Nixon dealt with the issues calmly and carefully. Viewers who expected to see a free-for-all were disappointed. The way the two men appeared on the television screen, however, may have been as important as what they said. Kennedy looked at the camera while answering questions, appearing to speak directly to his viewers and give them straight answers. Nixon was recovering from a severe bout of influenza, and he appeared tense and tired. He looked at the reporters who asked the questions instead of at the camera, giving some viewers the impression that he avoided eye contact with his audience, and thus suggesting that he was not trustworthy. Most commentators agreed that Kennedy gained from the encounter: many viewers who had previously felt he lacked the maturity necessary to be president were won over by his charm, poise, and confident manner.

While far fewer people watched the three later sessions, much discussion ensued regarding the influence of the Great Debates on the outcome of the 1960 presidential election. Some feared that the better TV performer was bound to come across as being the better candidate. "Is this a good way to judge a person's ability to serve as president of the United States?" they asked.

Kennedy ultimately won the election, but it was by the narrowest popular vote margin in more than eighty years. Some observers concluded that, had the Great Debates been broadcast on radio and not on television, Nixon would have won.

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

- **A.** the careers of Nixon and Kennedy
- **B.** how elections have changed since 1960
- **C.** domestic issues in the Kennedy-Nixon debates
- **D.** the presidential debates of 1960
- **E.** the qualifications of Nixon and Kennedy

**22.** According to the passage, which of the following would have been the most likely result if the candidates had **not** debated on television in 1960?

- **F.** Kennedy would have won the election anyway.
- **G.** The election results would have been much closer.
- **H.** Nixon would have had a better chance of winning the election.
- **J.** The candidates would not have debated at all.
- **K.** Nixon would have improved his on-screen performance.

**23.** Which of the following did critics in 1960 think could be an undesirable consequence of presidential debates on television?

- **A.** Candidates might no longer utilize other media to get their messages across.
- **B.** By being too cautious on television, candidates might fail to debate the issues seriously.
- **C.** Appearing on television might take up too much of a candidate's time.
- **D.** Americans might be persuaded to vote for a presidential candidate because of their television performance.
- **E.** Americans who did not watch every debate might not be fully informed about the candidates' stands.

**24.** According to the passage, how did Kennedy benefit from the debates?

- **F.** His grasp of domestic issues was shown to be superior to Nixon's.
- **G.** The debates focused on his years of experience in the Senate.
- **H.** He appeared to have attractive personal characteristics.
- **J.** He maintained eye contact with the reporters asking the questions.
- **K.** Nixon was seen as a superficial TV performer.

**25.** What evidence does the author provide to support the last sentence of the passage?

- **A.** Far fewer people watched the three later debates.
- **B.** Both candidates dealt with the issues calmly and carefully.
- **C.** The candidates did not cause a free-for-all.
- **D.** The first debate session was limited to domestic issues.
- **E.** Nixon was more experienced and well-known than Kennedy.

**26.** According to the passage, why did people who were not normally interested in politics tune in to the first of the Great Debates?

- **F.** Vice President Nixon was a popular politician.
- **G.** Television had never before been used in this way.
- **H.** They had heard that Kennedy was young and charismatic.
- **J.** They wanted to see if the newspaper polls were correct.
- **K.** The election was expected to be very close.

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In many cultures, the ugly physical appearance of the bat has given it an unearned reputation as an evil and vicious bearer of diseases. Many people, for example, believe that the little brown bat carries rabies. In fact, it is no more likely to transmit the disease than other animals, such as dogs. Brown bats actually help to prevent disease, not spread it. The basis of their diet is the mosquito, an insect that transmits more diseases than all the bats in the world combined.

A group of bat species known as flying foxes or fruit bats serve another important purpose, as a critical link in the reproduction of many tropical trees and shrubs. In the tropical rain forests of Africa, Asia, and Australia, plants such as avocadoes, date trees, cashews, and mangoes rely in part on flying foxes for pollination. One of Africa's most valuable hardwood trees, the iroko, is entirely dependent on this type of bat for pollination. Flying foxes feed on flowers, fruit, and nectar, flying from one plant to another and pollinating the plants as they go, much as bees do in other parts of the world. Because they are sloppy eaters, flying foxes drop fruit as they go, dispersing the seeds. They can travel great distances and convey pollen and seeds far from their origins, thereby maintaining the genetic biodiversity within a plant species.

Because of the importance of bats' role in pollination and seed distribution, scientists consider them a keystone in the ecosystems of tropical rain forests. Without bats, many bat-pollinated plants—and the animals that depend on them for food and shelter—would be threatened to the point of extinction. Areas outside the rain forests would be impacted as well, since the rain forests' lush vegetation replenishes the oxygen in the global atmosphere.

Unfortunately, many people are determined to get rid of bats. Flying foxes are at particular risk. In the wild, they feed on wild fruit, but when their rain forest habitat is reduced by conversion into farmland or residential areas, they occasionally raid cultivated fruit trees, spoiling the crops. Several flying fox species have been hunted to extinction, while others are seriously endangered.

Conservation groups and government agencies in many countries are attempting to change people's attitudes toward bats. When people learn that bats pollinate the trees and crops that provide their livelihood, they are more likely to appreciate and protect the bats in their area. There are also effective, non-harmful ways to deal with troublesome bats. Orchard owners can cover their trees with netting to discourage the bats, and there are humane methods for moving bats from places where they are not wanted. For the sake of the rain forests, and for life forms everywhere that depend on them, it is urgent that people apply a new twist to an old adage, and realize that ugliness is only skin deep.

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

- **A.** why plant species in the tropical rain forest are becoming endangered
- **B.** how the misunderstood bat benefits other life forms
- **C.** why rain forests are an important world resource
- **D.** how bats spread rabies and other diseases
- **E.** how bats pollinate tropical plants

**28.** What does the author intend to convey by the statement "ugliness is only skin deep" (line 70)?

- **F.** Some ugly animals eventually become beautiful.
- **G.** Bats are not as ugly as most people think.
- **H.** People shouldn't think that bats are harmful simply because they are ugly.
- **J.** People who find bats ugly do not believe that bats have an important environmental role.
- **K.** Beneficial animals are often considered ugly.

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**29.** Which of the following best describes animal species that function as a "keystone" (line 35)?

- **A.** They are a major factor in disease prevention.
- **B.** They are a food source for other animals.
- **C.** They pollinate every plant species.
- **D.** They are crucial in maintaining the balance of their ecosystem.
- **E.** They generate the oxygen in the atmosphere.

**30.** What would be the most immediate result if flying foxes became extinct?

- **F.** Other animal species would take their place.
- **G.** Tropical rain forests would become free of disease.
- **H.** Many animals would lose a food source.
- **J.** Many tropical plants would have difficulty with reproduction.
- **K.** The oxygen in the atmosphere would be quickly used up.

**31.** Why do flying foxes sometimes eat fruit from cultivated fruit trees?

- **A.** They prefer eating cultivated fruit to wild fruit.
- **B.** They are better able to spread pollen from cultivated fruit trees.
- **C.** The number of wild fruit trees has decreased.
- **D.** Cultivated fruit trees are completely dependent on bats for pollination.
- **E.** Declining mosquito populations can no longer feed the bats.

**32.** What is the most likely reason that the author mentioned the iroko tree?

- **F.** to provide an example of a useful plant that would die out without flying foxes
- **G.** to demonstrate that there are alternate ways to pollinate tropical plants
- **H.** to illustrate how rain forests supply oxygen to the atmosphere
- **J.** to show what flying foxes will do when wild fruit trees are unavailable
- **K.** to encourage farmers to cover their trees with netting

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Anyone who has watched TV news coverage of a hurricane has seen how destructive wind energy can be. But the power of the wind can also be put to constructive use. From sailboats to old-fashioned windmills to the high-tech, modern wind machines called turbines, people have devised ways to harness wind energy for thousands of years.

The first known attempt to use wind power was the sailboat. Ancient shipbuilders understood how to use forces like lift and momentum, even if they could not explain those forces scientifically. The principles behind sailing led to the development of the windmill. The first known windmills originated in Persia, an area that is now Iran, as early as A.D. 500. They were created to help with the demanding chores of grinding grain and pumping water. By the tenth century, windmills were used throughout central Asia; they were used in China as early as the thirteenth century.

In Europe, windmills came into widespread use during the twelfth century. As in other parts of the world, they were used for milling grain and pumping water. Windmills replaced the water wheel, which was turned by the movement of running water over paddles mounted around a wheel. The windmill was more adaptable and efficient than the water wheel and quickly became popular. For example, Holland, famous for its windmills, used the machines to pump seawater away from low-lying coastal bogs. This allowed the Dutch to reclaim large areas of land from the sea. Windmills eventually became sophisticated enough for use in a broad range of work, from sawmills and drainage pumping to processing goods such as dyes, tobacco, cocoa, and spices.

In the 1700s, as steam engines gained in popularity, the use of wind machines for many types of work declined. However, windmills still played an essential role in pumping water on farms throughout the American West and Midwest. Between 1850 and 1970, over six million small windmills were installed on American farms for watering livestock and meeting other water needs. In many remote areas even today, livestock production would be impossible without the use of windmills to provide water.

Beginning in the late nineteenth century, windmills were adapted to generate electricity. During the 1930s and '40s, thin-bladed windmills provided electricity for hundreds of thousands of farms across the United States. By the 1950s, however, power lines connected almost every household in America to a central power source, such as a utility company. After that, there was little need for wind turbines until the energy crisis of the 1970s. At that time, interest in wind turbines was renewed due to rising energy costs and concern about the future availability of fossil fuels such as oil, coal, and natural gas. The last several decades have seen the development of "wind farms," clusters of wind turbines that generate electricity. Efficient, clean, and fairly inexpensive to operate, wind farms may prove to be as important in the future as earlier windmills were in the past.

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

- **A.** the destructive power of wind energy
- **B.** the ways people have harnessed wind power throughout history
- **C.** reasons for developing wind farms to generate electricity
- **D.** how windmills are used in the United States
- **E.** the use of the windmill in the present day

**34.** Where were the first known windmills built?

- **F.** Persia
- **G.** North America
- **H.** Europe
- **J.** China
- **K.** Holland

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**35.** Which of the following best expresses the author's opinion regarding the future use of wind energy?

**A.** Wind farms will someday be the only source of electricity in the United States.
**B.** Wind farms will not be successful in providing large amounts of electricity.
**C.** A new energy source will be discovered that will diminish interest in wind farming.
**D.** Wind farms will become an important source of electricity in the United States.
**E.** Different energy sources will be developed because wind farming is too expensive.

**36.** The adaptation of old-fashioned water-pumping windmills into wind turbines that generate electricity illustrates

**F.** that modern technology is no improvement over ancient technology.
**G.** the inability of people to develop new solutions.
**H.** how wind power will eventually replace all other energy sources.
**J.** that water cannot be used to produce electricity.
**K.** the ability of people to think creatively.

**37.** Why were fewer American farms dependent on windmills for electrical power after the 1950s?

**A.** Windmills were not used for any purpose after that time.
**B.** The energy crisis had prompted interest in other fuel sources.
**C.** The energy crisis had stopped the development of wind turbines.
**D.** A centralized power system had connected almost all American homes.
**E.** Wind farms had replaced the need for individual windmills.

**38.** According to the passage, how did windmills aid the growth of the country of Holland?

**F.** Windmills helped Dutch shipbuilders use the forces of lift and momentum.
**G.** By pumping seawater out, the Dutch turned bogs into usable land.
**H.** Windmills made the country of Holland famous.
**J.** By pumping seawater, the Dutch flooded coastal bogs in order to improve ship travel.
**K.** In Holland, windmills led to the use of water wheels.

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The decade that began with the stock market crash in 1929 and ended with the declaration of war in Europe in 1939 was a turning point for art in the United States. Rejecting European trends, such as abstract art, American painters searched for a style that was distinctly American. It was a time of great social change—a society based on rural and small town life was rapidly being replaced by a society focused on city life and values. Although members of various groups are all referred to as "American Scene" painters, different groups painted their images of the United States in very different ways.

One group, sometimes called the Regionalists, included Thomas Hart Benton, Grant Wood, and John Steuart Curry, all from the Midwest. Their art was intensely patriotic and frequently glorified an older, simpler America. Their subject matter included church steeples, New England fishing villages, and midwestern cornfields. Grant Wood's most famous canvas is probably *American Gothic*, which shows a stiff and proper farm couple, the husband holding a pitchfork. The Regionalists were often muralists as well, painting local scenes on walls of state capitols and other public buildings. Enormously popular during the 1930s, Regionalist art is still treasured by many as a fond memory of times gone by.

While the Regionalists remembered the past, other American Scene artists painted the drab realities of the contemporary urban environment, testifying to its loneliness and anonymity. The Urban Realists, including Reginald Marsh, Isabel Bishop, and the Soyer brothers, were associated with the Art Students League in New York. These painters showed the high price paid by individual men and women struggling to survive the Depression. The names of some of their works illustrate the style: *Office Girls, Waiting, The Bowery.* For various reasons, their work has been largely forgotten today.

Edward Hopper was an artist who was associated with the American Scene but otherwise escaped further classification. Like the Urban Realists, he painted the tired dinginess of the urban streets during the Depression. Yet Hopper often found beauty in the midst of the city's monotony. For example, one of Hopper's best-known paintings, *Nighthawks*, shows several people sitting like robots in a brightly lit coffee shop at night, each apparently unaware of the others. Hopper was not interested in a return to the past. He presented what he saw without apology or sentimentality.

The American Scene art movement of the 1930s was characterized by realistic paintings that expressed the traditions and interests of people in the United States at that time. Because the paintings presented common images and mirrored the lives of many people, the general public readily identified with the subjects of the paintings. With the onset of World War II, a new spirit of internationalism swept through the art of the United States, and the American Scene painters became out of date. Although the movement did not last, it had reflected its own time with profound understanding.

**39.** According to the passage, why did ordinary people in the 1930s identify with the art of the American Scene painters?

**A.** The artists were primarily concerned with painting farm life.
**B.** People were given hope when they saw the paintings.
**C.** People wanted social and cultural change shown in their paintings.
**D.** The paintings suggested solutions to the problems of the period.
**E.** The paintings reflected the times in ways that were familiar to most viewers.

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**40.** Which of the following subjects would an Urban Realist painter be most likely to represent?

**F.** factory workers going home from work
**G.** sunset on a beach
**H.** a self-portrait
**J.** a European city scene
**K.** an abstract painting in black and white

**41.** Hopper's paintings contrast with the work of the Urban Realist painters by

**A.** portraying the beauty in America's past.
**B.** showing the ugliness of a city environment.
**C.** illustrating the move toward an international style.
**D.** revealing how dull urban life can include beauty.
**E.** presenting the trials of working people during the Depression.

**42.** How does the fourth paragraph contribute to the passage?

**F.** It describes the end of the American Scene movement.
**G.** It honors Edward Hopper as a great American Scene painter.
**H.** It explains why Edward Hopper's work has been forgotten.
**J.** It contrasts American Scene with Urban Realist styles.
**K.** It presents an American Scene painter who focused on beauty.

**43.** The author used the phrase "without apology" (line 62) to explain that Hopper did not feel he needed to justify

**A.** how he portrayed his subjects.
**B.** painting scenes from the past.
**C.** why *Nighthawks* became popular.
**D.** not joining the international art movement.
**E.** why he was an emotional painter.

**44.** What is the most likely reason that Regionalist art has retained some of its popularity while Urban Realist art has not?

**F.** Regionalist art depicts modern life as well as life in the past, while Urban Realist art depicts only the past.
**G.** Regionalist art more accurately portrays the time in which it was painted than Urban Realist art does.
**H.** Regionalist art shows American life as people wish to remember it while Urban Realist art does not.
**J.** Regionalist art represents the positive side of urban life more than Urban Realist art does.
**K.** Regionalist art more accurately depicts how Americans overcame the effects of the Depression than Urban Realist art does.

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

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

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

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

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

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

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

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

CONTINUE ON TO THE NEXT PAGE ►

**46.** What is the most likely reason that the author mentioned lead and diamond crystals in the last paragraph?

- **F.** to point out that solids other than ice have slippery surfaces
- **G.** to suggest that ice, lead, and diamonds are composed of the same materials
- **H.** to cast doubt on Faraday's theory of slipperiness
- **J.** to suggest that scientists shoot electrons at lead and diamond surfaces
- **K.** to suggest new uses for slippery substances

**47.** According to Faraday, why do two ice cubes fuse when held together?

- **A.** Friction causes the ice to melt and refreeze.
- **B.** The pressure melts and refreezes the ice cubes.
- **C.** The liquid layers on their surfaces freeze.
- **D.** The vibrations of the molecules on their surfaces increase.
- **E.** Their surface areas are perfectly smooth.

**48.** What is the most likely reason that the author mentioned the 1996 experiment at Lawrence Berkeley Laboratory?

- **F.** to provide evidence about the surface of ice
- **G.** to illustrate the weaknesses of scientific technology
- **H.** to show how Faraday tested his theory
- **J.** to suggest that the ice surface was solid, not liquid
- **K.** to explain why ice cubes freeze together

**49.** According to researchers at the Lawrence Berkeley Laboratory, why is the surface of ice "liquid-like" rather than "liquid"?

- **A.** because electrons rebound from the ice surface
- **B.** because molecules on the ice surface vibrate only up and down
- **C.** because the ice surface is wet
- **D.** because the ice surface is slipperier than a liquid surface
- **E.** because the temperature on the ice surface is slightly above freezing

**50.** According to the passage, which of the following undermines the friction theory of slipperiness?

- **F.** a person wearing flat-bottomed shoes gliding across the ice
- **G.** two ice cubes fused together
- **H.** electrons bouncing off an ice surface
- **J.** a person trying to skate on a sheet of glass or sheet metal
- **K.** a person slipping while standing immobile on ice

CONTINUE ON TO THE NEXT PAGE ▶

# PART 2 — MATHEMATICS

*Suggested Time — 75 Minutes*

50 QUESTIONS

## GENERAL INSTRUCTIONS

Solve each problem. Select the **best** answer from the choices given. Mark the letter of your answer on the answer sheet. You can do your figuring in the test booklet or on paper provided by the proctor. **DO NOT MAKE ANY MARKS ON YOUR ANSWER SHEET OTHER THAN FILLING IN YOUR ANSWER CHOICES.**

**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 figured out from the information given.

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

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

(5) Reduce all fractions to lowest terms.

**51.** $\frac{4.5}{0.1} \times 0.22 =$

**A.** 0.99
**B.** 1.99
**C.** 9.9
**D.** 99
**E.** 990

**52.** If $\frac{4}{5}$ of P is 48, what is $\frac{3}{5}$ of P?

**F.** 12
**G.** 15
**H.** 20
**J.** 36
**K.** 60

**53.** If $\frac{a}{b} = 2$ and $a = 8$, what is the value of $3b + a^2$?

**A.** 28
**B.** 70
**C.** 76
**D.** 88
**E.** 112

**54.** Carlos is picking colored pencils from a large bin that contains only 480 red pencils, 240 green pencils, and 160 blue pencils. Without looking, Carlos pulls out 22 pencils. If the pencils were distributed randomly in the bin, how many pencils of each color is it most likely that he picked?

**F.** 8 red, 7 green, 7 blue
**G.** 10 red, 7 green, 5 blue
**H.** 10 red, 8 green, 4 blue
**J.** 11 red, 6 green, 5 blue
**K.** 12 red, 6 green, 4 blue

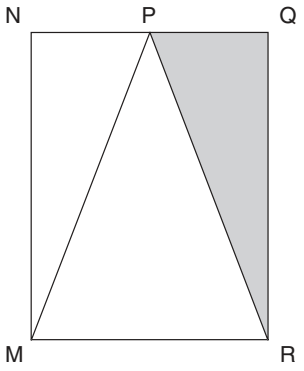
**55.** How many positive integers satisfy the inequality $x + 7 < 23$?

**A.** 15
**B.** 16
**C.** 17
**D.** 29
**E.** 30

**56.** $3.99 \div 1.5 =$

**F.** 0.266
**G.** 0.267
**H.** 2.0
**J.** 2.66
**K.** 2.67

**57.**

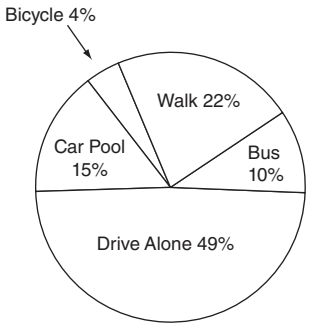



In the figure above, the base of $\triangle MPR$ is a side of rectangle MNQR, and point P is the midpoint of $\overline{NQ}$. If the area of the shaded region is 24 square centimeters, what is the area of the region that is **not** shaded?

**A.** 24 sq cm
**B.** 48 sq cm
**C.** 64 sq cm
**D.** 72 sq cm
**E.** 96 sq cm

**58.**

HOW PEOPLE GET TO WORK IN CENTER CITY




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

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

**F.** 18
**G.** 22
**H.** 2,700
**J.** 2,800
**K.** 3,000

**59.** If $x$ and $y$ are positive integers such that $0.75 = \frac{x}{y}$, what is the **least** possible value for $x$?

**A.** 1
**B.** 3
**C.** 4
**D.** 25
**E.** 75

**60.** $|190 - 210| + |19 - 21| + x = 100$

In the equation above, what is the value of $x$?

**F.** 78
**G.** 88
**H.** 100
**J.** 122
**K.** 123

**61.** Ms. Grant's car gets between 20 and 22 miles per gallon, inclusive. The gasoline she uses costs between \$4.20 and \$4.50 per gallon, inclusive. What is the **greatest** amount Ms. Grant will spend on gasoline to drive her car 200 miles?

**A.** \$37.27
**B.** \$40.90
**C.** \$42.00
**D.** \$45.00
**E.** \$99.00

**62.** The set P consists of all prime numbers greater than 6 and less than 36. What is the median of the numbers in P?

**F.** 17
**G.** 17.75
**H.** 18
**J.** 18.75
**K.** 19

**63.** What is the greatest common factor of 2,205 and 3,675?

**A.** 147
**B.** 245
**C.** 441
**D.** 735
**E.** 1,225

CONTINUE ON TO THE NEXT PAGE ▶

**64.**

$$\begin{array}{r} -2 \\ 4 \\ -6 \\ 8 \\ . \\ . \\ . \\ -22 \\ +\ 24 \\ \hline \end{array}$$

If the missing terms in the problem above were filled in according to the pattern, what would be the sum of all the terms?

**F.** $-6$
**G.** 2
**H.** 6
**J.** 10
**K.** 12

**65.**

SONGS PLAYED DURING ONE HOUR

| Number of Songs | Number of Radio Stations |
|---|---|
| 14 | 8 |
| 15 | 4 |
| 16 | 4 |
| 17 | 5 |
| 18 | 9 |

The table above shows the number of songs played during a specific hour by 30 different radio stations. What is the mean number of songs played during that hour by these stations?

**A.** 6
**B.** 8
**C.** 16.1
**D.** 16.5
**E.** 18

**66.** The fuel mix for a small engine contains only 2 ingredients: gasoline and oil. If the mix requires 5 ounces of gasoline for every 6 ounces of oil, how many ounces of gasoline are needed to make 33 ounces of fuel mix?

**F.** 3
**G.** 6
**H.** 15
**J.** $27\frac{1}{2}$
**K.** 165

**67.** In the set of consecutive integers from 12 to 30, inclusive, there are 4 integers that are multiples of both 2 and 3. How many integers in the set are multiples of **neither** 2 nor 3?

**A.** 2
**B.** 5
**C.** 6
**D.** 13
**E.** 15

**68.** A pitcher contained 32 ounces of orange juice and 12 ounces of grapefruit juice. More grapefruit juice was added to the pitcher until grapefruit juice represented $\frac{1}{3}$ of the pitcher's contents. How many ounces of grapefruit juice were added?

**F.** 2 oz
**G.** 4 oz
**H.** 8 oz
**J.** 16 oz
**K.** 44 oz

**69.** A roofing contractor uses shingles at a rate of 3 bundles for each 96 square feet of roof covered. At this rate, how many bundles will he need to cover a roof that is 416 square feet?

**A.** 5
**B.** 12
**C.** 13
**D.** 14
**E.** 15

**70.** How many ways can the letters in the word RAIN be arranged horizontally so that the vowels (A and I) are always immediately next to each other (either AI or IA)?

**F.** 6
**G.** 8
**H.** 12
**J.** 16
**K.** 24

**71.**

| Item | Quantity Puchased | Price Per Item |
|---|---|---|
| Rain Coat | 1 | $102.00 |
| Slacks | 2 | $60.00 |
| Shirt | 2 | $35.00 |

One state has a 6% sales tax on clothing items priced at $75 or higher, and no sales tax on clothing items priced under $75. What is the total tax on the items in the table above?

**A.** $6.12
**B.** $6.72
**C.** $13.32
**D.** $17.00
**E.** $203.12

**72.** There are 45 eighth graders and 20 seventh graders in a school club. The president of this club wants 40% of the club's members to be seventh graders. How many **more** seventh graders must join the club in order to meet the president's wishes? (Assume that the number of eighth graders remains the same.)

**F.** 6
**G.** 7
**H.** 8
**J.** 10
**K.** 27

**73.** If R, S, and T are integers and R + S and T − S are both odd numbers, which of the following must be an **even** number?

**A.** R + T
**B.** S + T
**C.** R
**D.** S
**E.** T

**74.** For what value of $z$ is $z - \frac{1}{3}z = 12$?

**F.** $^{-}18$
**G.** 4
**H.** 8
**J.** 12
**K.** 18

**75.**

| | |
|---|---|
| Regular Price | $2.49 |
| Discount | – $0.60 |
| Sale Price | $1.89 |
| 6% Tax | $0.15 |
| Total | $2.04 |

Nikolai bought a packet of pens. His receipt is shown above. Assume that sales tax is rounded to the nearest cent. If the 6% sales tax had been computed on the sale price instead of on the regular price, how much lower would the tax have been?

**A.** $0.01
**B.** $0.02
**C.** $0.03
**D.** $0.04
**E.** $0.36

**76.** The regular price of a 12-ounce bag of candy is $2.90. Lily has a coupon for 30% off one of these bags. What is the price per ounce (to the nearest cent) that Lily will pay if she uses the coupon?

**F.** $0.07
**G.** $0.15
**H.** $0.17
**J.** $0.22
**K.** $0.24

**77.** On a particular vehicle, the front tire makes three revolutions for every one revolution the back tire makes. How many times larger is the radius of the back tire than the radius of the front tire?

**A.** $\frac{1}{3}$
**B.** 3
**C.** $\frac{3}{2}\pi$
**D.** $3\pi$
**E.** 9

**78.** PEOPLE PER VEHICLE AT CHECKPOINT

| Number of People in the 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 the checkpoint yesterday morning. How many of the 420 vehicles contained **at least** 3 people?

**F.** 42
**G.** 63
**H.** 105
**J.** 315
**K.** 378

**79.** Jack and Roberto were assigned to guard a tower. Each was to watch for 5 hours, then rest 5 hours while the other watched. If Roberto began his first watch at 6:00 p.m., at what time will he begin his third watch?

**A.** 11:00 p.m.
**B.** 4:00 a.m.
**C.** 9:00 a.m.
**D.** 7:00 p.m.
**E.** 2:00 p.m.

**80.**


On the number line above, point E (not shown) is the midpoint of $\overline{AC}$ and point F (not shown) is the midpoint of $\overline{BD}$. What is the length of $\overline{EF}$?

**F.** 1 unit
**G.** 2 units
**H.** 2.5 units
**J.** 3 units
**K.** 11 units

**81.** A video game originally priced at $44.50 was on sale for 10% off. Julian received a 20% employee discount applied to the sale price. How much did Julian pay for the video game? (Assume that there is no tax.)

**A.** $31.15
**B.** $32.04
**C.** $35.60
**D.** $40.05
**E.** $43.61

**82.** If $r = 3q + 2$ and $q = \frac{1}{3^n}$ for $n = 1, 2,$ or 3, what is the **least** possible value of $r$?

**F.** 1

**G.** $2\frac{1}{9}$

**H.** $2\frac{1}{3}$

**J.** 3

**K.** 5

**83.** $|(-6) - (-5) + 4| - |3 - 11| =$

**A.** $-7$
**B.** $-5$
**C.** $-1$
**D.** 1
**E.** 11

**84.** There are 1,000 cubic centimeters in 1 liter and 1,000 cubic millimeters in 1 milliliter. How many cubic millimeters are there in 1,000 cubic centimeters?

**F.** 1,000
**G.** 10,000
**H.** 100,000
**J.** 1,000,000
**K.** 1,000,000,000

CONTINUE ON TO THE NEXT PAGE ▶

**85.** A radio station plays Samantha's favorite song 6 times each day at random times between 8:00 a.m. and 5:00 p.m. The song is 5 minutes long. If Samantha turns on the radio at a random time between 8:00 a.m. and 5:00 p.m., what is the probability that her favorite song will be playing at that time?

**A.** $\frac{1}{30}$

**B.** $\frac{1}{18}$

**C.** $\frac{1}{6}$

**D.** $\frac{1}{5}$

**E.** $\frac{1}{3}$

**86.** Set R contains all integers from 10 to 125, inclusive, and Set T contains all integers from 82 to 174, inclusive. How many integers are included in R, but **not** in T?

**F.** 23
**G.** 48
**H.** 49
**J.** 71
**K.** 72

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

**A.** $1\frac{2}{3}$ hr

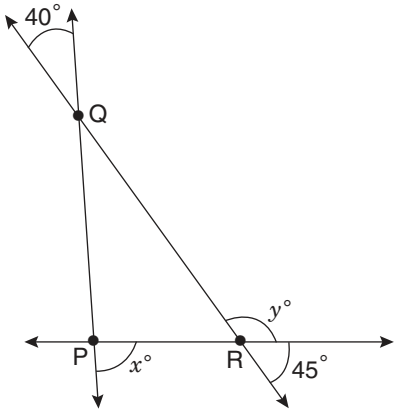
**B.** $2\frac{1}{6}$ hr

**C.** $3\frac{1}{4}$ hr

**D.** $3\frac{3}{4}$ hr

**E.** $7\frac{1}{2}$ hr

**88.**




The figure above shows three intersecting straight lines. What is the value of $y - x$?

**F.** 40
**G.** 50
**H.** 85
**J.** 95
**K.** 135

**89.** Joe began to increase the speed of his car at 2:00 p.m. Since that time, the speed of Joe's car has been steadily increasing by $1\frac{1}{2}$ miles per hour for each half minute that has passed. If the car is now traveling $65\frac{1}{2}$ miles per hour, for how many minutes has the car been exceeding the speed limit of 55 miles per hour?

**A.** $3\frac{1}{3}$ min

**B.** $3\frac{1}{2}$ min

**C.** $4\frac{1}{2}$ min

**D.** 5 min

**E.** 7 min

CONTINUE ON TO THE NEXT PAGE ▶

**90.** If $x$, $y$, and $z$ are numbers such that $xy + xz = 100$, what is the value of $\frac{x}{5}(3y + 3z) + 10$?

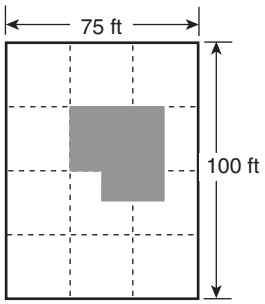
**F.** $60 + 2x$
**G.** 62
**H.** 70
**J.** 130
**K.** $130 + 2x$

**91.** Let $N = -(|-3| - |-8| + |-4|)$.

What is the value of $-|N|$?

**A.** $-9$
**B.** $-4$
**C.** $-1$
**D.** 1
**E.** 9

**92.**




The drawing above represents a rectangular lot containing a building, indicated by the shaded region. The dashed lines divide the lot into twelve equal-sized squares. If the unshaded portion of the lot is to be paved, about how many square feet will be paved?

**F.** 4,000 sq ft
**G.** 5,000 sq ft
**H.** 6,000 sq ft
**J.** 7,000 sq ft
**K.** 8,000 sq ft

**93.** If $x$ can be any integer, what is the greatest possible value of the expression $1 - x^2$?

**A.** $-1$
**B.** 0
**C.** 1
**D.** 2
**E.** Infinity

**94.** A recent survey asked students what pets they have. Based on the results, the following statements are all true:

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

How many students were surveyed?

**F.** 40
**G.** 42
**H.** 45
**J.** 46
**K.** 51

**95.** Ang has $x$ dollars in his savings account, and Julia has $y$ dollars in her savings account. Ang gives Julia $\frac{1}{3}$ of the money in his savings account, which Julia deposits into her savings account. Julia then spends $\frac{1}{4}$ of the total in her savings account. Express the amount of money Julia spent in terms of $x$ and $y$.

**A.** $\frac{y}{4} + \frac{x}{12}$

**B.** $\frac{y}{4} + \frac{x}{3}$

**C.** $\frac{y}{4} + \frac{x}{7}$

**D.** $\frac{3y}{4} + \frac{x}{4}$

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

**96.** Nam worked on a job for 10 days. On each of the last 2 days, he worked 2 hours more than the mean number of hours he worked per day during the first 8 days. If he worked 69 hours in all, how many hours did he work during the last 2 days together?

**F.** 8.5
**G.** 10.5
**H.** 13.0
**J.** 15.0
**K.** 17.0

**97.**

PRICES FOR AD SPACE

| Space | Price |
|---|---|
| $\frac{1}{4}$ page | $200 |
| $\frac{1}{2}$ page | $350 |
| full page | $600 |

The table above shows prices for newspaper advertising. A store purchased quarter pages, half pages, and full pages of space in equal numbers for a total of $11,500. What is the total amount of page space the store purchased?

**A.** $1\frac{3}{4}$ pages

**B.** 10 pages

**C.** $16\frac{1}{2}$ pages

**D.** $17\frac{1}{4}$ pages

**E.** $17\frac{1}{2}$ pages

**98.** One week the price of gasoline dropped by $0.05 per gallon. Madison's car travels 27 miles each way to work, and her car travels 30 miles on each gallon of gasoline. What were her total savings, to the nearest cent, over the 5-day work week?

**F.** $0.23
**G.** $0.25
**H.** $0.30
**J.** $0.45
**K.** $0.50

**99.** A rectangular floor is 12 feet wide and 16 feet long. It must be covered with square tiles that are 8 inches on each side. Assume there is no space between adjacent tiles. If the tiles cost $8 each, how much will it cost to buy the tiles needed to cover the floor?

**A.** $24
**B.** $64
**C.** $192
**D.** $2,304
**E.** $3,456

**100.** {1, 2, 3, 4, 5, 6}

Company X wants to assign each employee a 3-digit ID number formed from digits in the set shown above. No digit may appear more than once in an ID number, and no two employees may be assigned the same ID number. What is the greatest total number of possible different ID numbers?

**F.** 20
**G.** 120
**H.** 180
**J.** 216
**K.** 720

THIS IS THE END OF THE TEST. IF TIME REMAINS, YOU MAY CHECK YOUR ANSWERS TO PART 2 AND PART 1. BE SURE THAT THERE ARE NO STRAY MARKS, PARTIALLY FILLED ANSWER CIRCLES, OR INCOMPLETE ERASURES ON YOUR ANSWER SHEET. ■