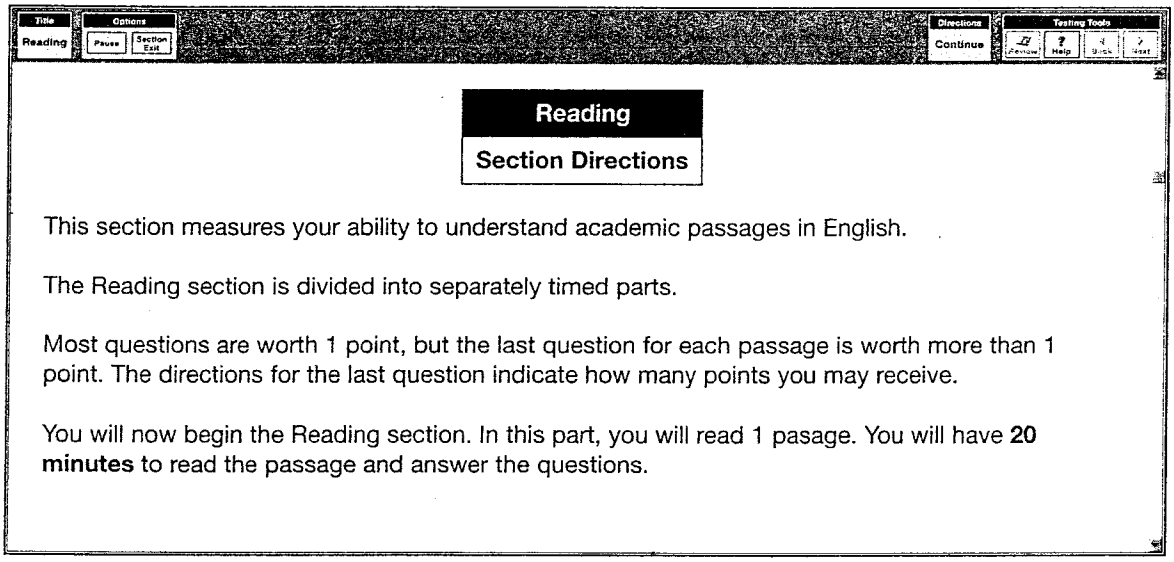
COMPLETE TEST 1

READING 1



Read the passage.

20 minutes

Paragraph

Prehistoric Astronomers

1 Prehistoric peoples most certainly took note of the recurring patterns of movements in the sky of such celestial bodies as the Sun, the Moon, the planets, and the stars, and they most certainly noted that events in their world, such as seasonal fluctuations in weather, which in turn had an effect on the lives of the plants and animals in their world, were often correlated with the movements of the celestial bodies. Because it was important for prehistoric people to have knowledge, for example, of when it was the best time to plant crops or when game herds would be migrating, early farmers and hunters took a great interest in the movements of celestial bodies. An understanding of the relationship between the movements of celestial bodies and recurring patterns of events on Earth was of paramount importance in many cultures; thus, many cultures in widely separated areas of the world developed methods for monitoring astronomical events.

2 The field of archeoastronomy, which combines knowledge and expertise from the fields of archeology and astronomy, is dedicated to the study of the astronomical knowledge of prehistoric cultures. Archeoastronomers who have been studying prehistoric cultures in North America have discovered various devices that made it possible for prehistoric people to study and record astronomical events. An alignment of stones in Wyoming that is known as the Bighorn Medicine Wheel, the remnants of a circular-shaped structure created with wooden posts at Cahoki in Illinois, and specially designed windows in structures of the Southwest that allowed the rays of the Sun to hit designated marks on inside walls are all believed to be constructions that serve the function of monitoring and measuring astronomical events.

3 One particular construction, which is located in the Chaco Canyon area of the state of New Mexico, has been the subject of considerable attention and discussion among archeologists and astronomers. This construction, which is at least 700 years old, consists of large slabs of rock located on top of the flat surface of a high butte that seem to form an observatory of sorts. What makes it appear to experts to be an observatory is that the slabs of rock are positioned so that shafts of sunlight fall between them and hit spiral markings carved into the side of a cliff. As the Sun changes positions with the progression of the seasons, the shafts of light fall in different places on the markings in the cliff wall. Using this system, it must have been possible for early inhabitants of the area to predict upcoming seasonal changes and the events based on them.

4 One question that has been the focus of considerable discussion is whether the stones were actually placed in their current location by early inhabitants of the region or whether the forces of nature created the arrangement. While some scientists argue that the stones could not have fallen in the current arrangement by mere happenstance and must have been purposefully positioned, others find it harder to believe that the huge stones could have been moved and easier to believe that the marks on the cliff wall were placed to reflect the positions where the slabs had fallen naturally. Whether or not the slabs were positioned by the local population, the structure correlating the positions of the slabs and the markings on the cliff wall represents a remarkably sophisticated method of following astronomical events.

Refer to this version of the passage to answer the questions that follow.

Paragraph

Prehistoric Astronomers

1 Prehistoric peoples most certainly took note of the recurring patterns of movements in the sky of such celestial bodies as the Sun, the Moon, the planets, and the stars, and they most certainly noted that events in their world, such as seasonal fluctuations in weather, which in turn had an effect on the lives of the plants and animals in their world, were often correlated with the movements of the celestial bodies. Because it was important for prehistoric people to have knowledge, for example, of when it was the best time to plant crops or when game herds would be migrating, early farmers and hunters took a great interest in the movements of celestial bodies. An understanding of the relationship between the movements of celestial bodies and recurring patterns of events on Earth was of paramount importance in many cultures; thus, many cultures in widely separated areas of the world developed methods for monitoring astronomical events.

2 7A The field of archeoastronomy, which combines knowledge and expertise from the fields of archeology and astronomy, is dedicated to the study of the astronomical knowledge of prehistoric cultures. 7B Archeoastronomers who have been studying prehistoric cultures in North America have discovered various devices that made it possible for prehistoric people to study and record astronomical events. 7C An alignment of stones in Wyoming that is known as the Bighorn Medicine Wheel, the remnants of a circular-shaped structure created with wooden posts at Cahoki in Illinois, and specially designed windows in structures of the Southwest that allowed the rays of the Sun to hit designated marks on inside walls are all believed to be constructions that serve the function of monitoring and measuring astronomical events. 7D

3 One particular construction, which is located in the Chaco Canyon area of the state of New Mexico, has been the subject of considerable attention and discussion among archeologists and astronomers. This construction, which is at least 700 years old, consists of large slabs of rock located on top of the flat surface of a high butte that seem to form an observatory of sorts. What makes it appear to experts to be an observatory is that the slabs of rock are positioned so that shafts of sunlight fall between them and hit spiral markings carved into the side of a cliff. As the Sun changes positions with the progression of the seasons, the shafts of light fall in different places on the markings in the cliff wall. Using this system, it must have been possible for early inhabitants of the area to predict upcoming seasonal changes and the events based on them.

4 One question that has been the focus of considerable discussion is whether the stones were actually placed in their current location by early inhabitants of the region or whether the forces of nature created the arrangement. While some scientists argue that the stones could not have fallen in the current arrangement by mere happenstance and must have been purposefully positioned, others find it harder to believe that the huge stones could have been moved and easier to believe that the marks on the cliff wall were placed to reflect the positions where the slabs had fallen naturally. Whether or not the slabs were positioned by the local population, the structure correlating the positions of the slabs and the markings on the cliff wall represents a remarkably sophisticated method of following astronomical events.

Questions

1. The word correlated in paragraph 1 could best be replaced by
   - Ⓐ in disagreement
   - Ⓑ in coordination
   - Ⓒ in touch
   - Ⓓ in spirit

2. It is NOT mentioned in paragraph 1 that prehistoric peoples were interested in
   - Ⓐ the movements of the stars
   - Ⓑ changes in the weather
   - Ⓒ migration patterns of certain animals
   - Ⓓ the evolution of various plants

3. The word paramount in paragraph 1 could best be replaced by
   - Ⓐ tall
   - Ⓑ dependable
   - Ⓒ supreme
   - Ⓓ computed

4. Which of the following would an archeoastronomer be most likely to study?
   - Ⓐ Plans to send a spacecraft to Mars
   - Ⓑ Potential remnants of an early civilization's lunar calendar
   - Ⓒ Tools used by a prehistoric tribe to prepare food
   - Ⓓ Geographic formations on the Moon

5. The author mentions An alignment of stones in Wyoming, a circular-shaped structure at Cahoki, and specially designed windows in structures of the Southwest in paragraph 2 in order to
   - Ⓐ provide proof that archeoastronomers have been studying prehistoric cultures
   - Ⓑ provide support for the idea that North American cultures built creative structures
   - Ⓒ provide evidence that certain astronomical events have not changed over time
   - Ⓓ provide examples of ways that prehistoric peoples monitored occurrences in the sky

6. The word serve in paragraph 2 could best be replaced by
   - Ⓐ fulfill
   - Ⓑ provide
   - Ⓒ assist
   - Ⓓ demonstrate

7. Look at the four squares [■] that indicate where the following sentence can be added to paragraph 2.

   This apparent understanding of certain aspects of astronomy by certain prehistoric cultures is of great academic interest today.

   Click on a square [■] to add the sentence to the passage.

8. What is stated in paragraph 3 about the construction in Chaco Canyon?
   - Ⓐ It was created from a single piece of stone.
   - Ⓑ It prevents sunlight from entering the area.
   - Ⓒ It was built before the fourteenth century.
   - Ⓓ It is located in a canyon.

9. The phrase of sorts in paragraph 3 is closest in meaning to
   - Ⓐ of opportunity
   - Ⓑ of some kind
   - Ⓒ of the past
   - Ⓓ of fate

10. The word them in paragraph 3 refers to
    - Ⓐ experts
    - Ⓑ slabs
    - Ⓒ shafts
    - Ⓓ markings

11. Which of the sentences below expresses the essential information in the highlighted sentence in paragraph 4? *Incorrect* choices change the meaning in important ways or leave out essential information.

Ⓐ One issue is whether the stones were positioned by nature or by people.

Ⓑ Early inhabitants often discussed where the stones should be placed.

Ⓒ The current location of the stones was chosen because it provides the most natural setting.

Ⓓ There is much discussion about how often early inhabitants moved the stones.

12. The word happenstance in paragraph 4 is closest in meaning to

Ⓐ standing

Ⓑ event

Ⓒ order

Ⓓ chance

13.

Directions: An introductory sentence or a brief summary of the passage is provided below. Complete the summary by selecting the THREE answer choices that express the most important ideas in the passage. Some sentences do not belong in the summary because they express ideas that are not presented in the passage or are minor ideas in the passage. ***This question is worth 2 points.***
This passage discusses the study of astronomy as it refers to prehistoric cultures in North America.
•
•
•

Answer Choices (choose 3 to complete the chart):

(1) The structure at Chaco Canyon was most likely used for something other than astronomy.

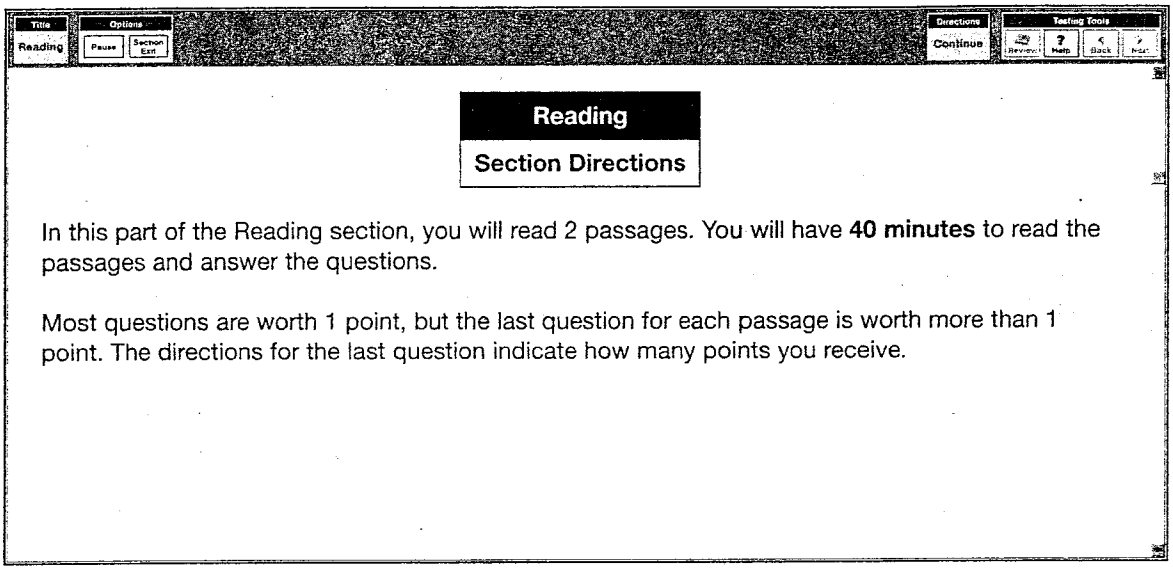
(2) Prehistoric cultures in North America were not as advanced in their study of astronomy as were cultures in other parts of the world.

(3) One structure used by a certain prehistoric culture to monitor astronomical events was either discovered or created by the culture.

(4) Prehistoric cultures in North America created devices to monitor astronomical events.

(5) The Bighorn Medicine Wheel was constructed with stones.

(6) Prehistoric cultures in North America most likely understood the relationship between astronomy and their daily lives.


Title
Reading
Options
Pause
Section Exit
Directions
Continue
Testing Tools
Review
Help
Back
Next
Reading
Section Directions
In this part of the Reading section, you will read 2 passages. You will have 40 minutes to read the passages and answer the questions.
Most questions are worth 1 point, but the last question for each passage is worth more than 1 point. The directions for the last question indicate how many points you receive.

READING 2

Read the passage.

40 minutes

Paragraph

Truman and the Railroads

1 The period following World War II was filled with a succession of crises as the United States dealt with the difficulty of postwar reconversion to a peacetime economy. A threatened railroad strike in 1946 was one of many crises that led to a reconsideration of the interrelationships among government, management, and labor.

2 Organized labor, which had fared well during the war years of 1939–1945, faced severe problems because of the swift demobilization of 13 million service personnel following the war and the destabilizing results of industrial reconversions from wartime to peacetime uses. During late 1945 and early 1946, a record wave of labor disputes and strikes hit the United States, and even more strikes and disputes were expected. At the height of the problems, more than 500 strikes were under way, some of them in industries that were highly critical to the overall U.S. economy, including coal, steel, cars, and oil. When a national strike was threatened by the railroads in the spring of 1946, the government moved into action, believing that the U.S. economy was threatened were it to take place.

3 President Harry S. Truman had dealt rather patiently with the labor problems until the spring of 1946. Throughout his political career, Truman had been a friend of organized labor and had been strongly supported by labor in his elections, and when the railroad strike was first threatened, he called for a 60-day mediation period while the issues, particularly the main issue of a wage hike for railroad workers, were negotiated between management and labor. By April, 18 of the 20 unions related to the railroads had arrived at an agreement; however, the remaining unions which together controlled 280,000 workers and were essential to the operation of the railroads, were dissatisfied and set a date for a strike.

4 The day before the strike deadline, Truman's patience wore thin, and he signed an executive order authorizing government seizure of the railroads. Under threat of having the government take over the operation of the railroads, the two unions in question agreed to a five-day delay in the strike. Truman even suggested an 18.5-cent per hour pay raise for railroad workers. However, as the strike deadline approached, negotiations remained at a stalemate. The strike began as scheduled and had an immediate impact; of the country's 200,000 trains, only a few hundred remained in operation. Infuriated, Truman took to the radio waves and delivered a burning speech to the public; two days later, he delivered a speech to Congress blasting the striking workers and urging Congress to take unprecedented steps to break the strike, including urging approval to draft striking workers into military service. As Truman was delivering the speech, he was handed a note stating that the strike had been settled.

5 Even though the strike was resolved, deep issues had been raised over what role the government should play in disputes between management and labor. Truman's proposal to use the federal government to break a strike by drafting strikers into the armed forces brought this issue to the fore. Although management was pleased with the toughness that Truman had shown and many citizens were pleased that disruption of the economy had been avoided, concern was expressed about the constitutionality of having Congress take such a step. The Labor Management Relations Act (also known as the Taft-Hartley Act), which was enacted in the year following the strike, was an attempt to clarify some of the interrelationships among government, management, and labor.

Refer to this version of the passage to answer the questions that follow.

Paragraph

Truman and the Railroads

1 The period following World War II was filled with a succession of crises as the United States dealt with the difficulty of postwar reconversion to a peacetime economy. A threatened railroad strike in 1946 was one of many crises that led to a reconsideration of the interrelationships among government, management, and labor.

2 Organized labor, which had fared well during the war years of 1939–1945, faced severe problems because of the swift demobilization of 13 million service personnel following the war and the destabilizing results of industrial reconversions from wartime to peacetime uses. During late 1945 and early 1946, a record wave of labor disputes and strikes hit the United States, and even more strikes and disputes were expected. At the height of the problems, more than 500 strikes were under way, some of them in industries that were highly critical to the overall U.S. economy, including coal, steel, cars, and oil. When a national strike was threatened by the railroads in the spring of 1946, the government moved into action, believing that the U.S. economy was threatened were it to take place.

3 President Harry S. Truman had dealt rather patiently with the labor problems until the spring of 1946. Throughout his political career, Truman had been a friend of organized labor and had been strongly supported by labor in his elections, and when the railroad strike was first threatened, he called for a 60-day mediation period while the issues, particularly the main issue of a wage hike for railroad workers, were negotiated between management and labor. By April, 18 of the 20 unions related to the railroads had arrived at an agreement; however, the remaining unions which together controlled 280,000 workers and were essential to the operation of the railroads, were dissatisfied and set a date for a strike.

4 The day before the strike deadline, Truman's patience wore thin, and he signed an executive order authorizing government seizure of the railroads. **22A** Under threat of having the government take over the operation of the railroads, the two unions in question agreed to a five-day delay in the strike. **22B** Truman even suggested an 18.5-cent per hour pay raise for railroad workers. **22C** However, as the strike deadline approached, negotiations remained at a stalemate. **22D** The strike began as scheduled and had an immediate impact; of the country's 200,000 trains, only a few hundred remained in operation. Infuriated, Truman took to the radio waves and delivered a burning speech to the public; two days later, he delivered a speech to Congress blasting the striking workers and urging Congress to take unprecedented steps to break the strike, including urging approval to draft striking workers into military service. As Truman was delivering the speech, he was handed a note stating that the strike had been settled.

5 Even though the strike was resolved, deep issues had been raised over what role the government should play in disputes between management and labor. Truman's proposal to use the federal government to break a strike by drafting strikers into the armed forces brought this issue to the fore. Although management was pleased with the toughness that Truman had shown and many citizens were pleased that disruption of the economy had been avoided, concern was expressed about the constitutionality of having Congress take such a step. The Labor Management Relations Act (also known as the Taft-Hartley Act), which was enacted in the year following the strike, was an attempt to clarify some of the interrelationships among government, management, and labor.

Refer to this version of the passage to answer the questions that follow.

Paragraph

Truman and the Railroads

1 The period following World War II was filled with a succession of crises as the United States dealt with the difficulty of postwar reconversion to a peacetime economy. A threatened railroad strike in 1946 was one of many crises that led to a reconsideration of the interrelationships among government, management, and labor.

2 Organized labor, which had fared well during the war years of 1939–1945, faced severe problems because of the swift demobilization of 13 million service personnel following the war and the destabilizing results of industrial reconversions from wartime to peacetime uses. During late 1945 and early 1946, a record wave of labor disputes and strikes hit the United States, and even more strikes and disputes were expected. At the height of the problems, more than 500 strikes were under way, some of them in industries that were highly critical to the overall U.S. economy, including coal, steel, cars, and oil. When a national strike was threatened by the railroads in the spring of 1946, the government moved into action, believing that the U.S. economy was threatened were it to take place.

3 President Harry S. Truman had dealt rather patiently with the labor problems until the spring of 1946. Throughout his political career, Truman had been a friend of organized labor and had been strongly supported by labor in his elections, and when the railroad strike was first threatened, he called for a 60-day mediation period while the issues, particularly the main issue of a wage hike for railroad workers, were negotiated between management and labor. By April, 18 of the 20 unions related to the railroads had arrived at an agreement; however, the remaining unions which together controlled 280,000 workers and were essential to the operation of the railroads, were dissatisfied and set a date for a strike.

4 The day before the strike deadline, Truman's patience wore thin, and he signed an executive order authorizing government seizure of the railroads. **22A** Under threat of having the government take over the operation of the railroads, the two unions in question agreed to a five-day delay in the strike. **22B** Truman even suggested an 18.5-cent per hour pay raise for railroad workers. **22C** However, as the strike deadline approached, negotiations remained at a stalemate. **22D** The strike began as scheduled and had an immediate impact; of the country's 200,000 trains, only a few hundred remained in operation. Infuriated, Truman took to the radio waves and delivered a burning speech to the public; two days later, he delivered a speech to Congress blasting the striking workers and urging Congress to take unprecedented steps to break the strike, including urging approval to draft striking workers into military service. As Truman was delivering the speech, he was handed a note stating that the strike had been settled.

5 Even though the strike was resolved, deep issues had been raised over what role the government should play in disputes between management and labor. Truman's proposal to use the federal government to break a strike by drafting strikers into the armed forces brought this issue to the fore. Although management was pleased with the toughness that Truman had shown and many citizens were pleased that disruption of the economy had been avoided, concern was expressed about the constitutionality of having Congress take such a step. The Labor Management Relations Act (also known as the Taft-Hartley Act), which was enacted in the year following the strike, was an attempt to clarify some of the interrelationships among government, management, and labor.

Questions

14. The phrase fared well in paragraph 2 is closest in meaning to

Ⓐ recovered from illness
Ⓑ won battles
Ⓒ made good wages
Ⓓ experienced good fortune

15. According to paragraph 2, in late 1945 and early 1946

Ⓐ there were labor problems because too many workers were in the military
Ⓑ there were labor problems because too many people were leaving the military
Ⓒ there were 500 strikes in the railroad industry
Ⓓ there were 500 strikes in critical industries

16. The word it in paragraph 2 refers to

Ⓐ a national strike
Ⓑ the government
Ⓒ action
Ⓓ the U.S. economy

17. The phrase called for in paragraph 3 is closest in meaning to

Ⓐ criticized
Ⓑ cheered
Ⓒ proposed
Ⓓ postponed

18. According to paragraph 3, it is NOT true that the railroad workers

Ⓐ were all in favor of the strike
Ⓑ were interested in higher pay
Ⓒ from two unions set a strike date
Ⓓ turned down Truman's offer of a pay raise

19. Why does the author mention 280,000 workers in paragraph 3?

Ⓐ To indicate how many workers were opposed to the strike
Ⓑ To demonstrate that the railroads were not really a critical industry
Ⓒ To support management's claim that a wage increase was not possible
Ⓓ To illustrate how serious the strike threat was

20. The phrase wore thin in paragraph 4 is closest in meaning to

Ⓐ was extended
Ⓑ decreased
Ⓒ lightened
Ⓓ lost weight

21. The phrase remained at a stalemate in paragraph 4 is closest in meaning to

Ⓐ stayed on target
Ⓑ proceeded on a friendly basis
Ⓒ suddenly started up again
Ⓓ were at a standstill

22. Look at the four squares [■] that indicate where the following sentence can be added to paragraph 4.

This was an offer that was considerably more generous than previous offers.

Click on a square [■] to add the sentence to the passage.

23. The word steps in paragraph 4 could best be replaced by

Ⓐ paces
Ⓑ measures
Ⓒ stairs
Ⓓ suggestions

24. It can be inferred from paragraph 4 that

Ⓐ Truman actually drafted striking workers into the military
Ⓑ Congress passed a law allowing the drafting of striking workers
Ⓒ it was the threat of drafting strikers that ended the strike
Ⓓ Truman was actually opposed to drafting workers into the military

25. Which of the sentences below expresses the essential information in the highlighted sentence in paragraph 5? *Incorrect* choices change the meaning in important ways or leave out essential information.

Ⓐ Though some were pleased that Truman had kept the economy going, there was concern about how he had done it.

Ⓑ During the strike, the economy was disrupted, and Congress was forced to take steps to fix it.

Ⓒ Because of the effects of the strike on the citizens of the country, it was necessary for Congress to make changes to the Constitution.

Ⓓ Management took tough actions during the strike; as a result, Congress expressed concern about the steps that management had taken.

26.

Directions: An introductory sentence or a brief summary of the passage is provided below. Complete the summary by selecting the FOUR answer choices that express the most important ideas in the passage. Some sentences do not belong in the summary because they express ideas that are not presented in the passage or are minor ideas in the passage. ***This question is worth 3 points.***
This passage discusses Truman and organized labor.
•
•
•
•

Answer Choices (choose 4 to complete the chart):

(1) In response to a threatened strike by railroad workers, Truman took strong actions.

(2) A law was passed after the railroad strike in an attempt to clarify the relationship between labor and government.

(3) The railroad workers went on strike in order to obtain shorter working days.

(4) Truman's actions with the railroad workers raised issues about the relationship between labor and government.

(5) During the railroad strike, only a small percentage of the country's trains were operating.

(6) Truman initially dealt calmly with the many labor problems immediately following the war.

READING 3

Read the passage.

Paragraph

Mathematical Bases

1 The system of numeration that is now most widely used is a base-10 system with the following characteristics: each number from 1 to 10 as well as the powers of 10 (such as one hundred or one thousand) has a distinctive name, and the names of the other numbers tend to be combinations of the names of the numbers from 1 to 10 and the powers of 10. In most Indo-European, Semitic, and Mongolian languages, the numerical systems have a decimal base and conform at least approximately to this theoretical model. The almost universal adoption of the base-10 numerical system was undoubtedly influenced by the fact that humans have ten fingers, since people most likely first learned to count on their fingers. Though the base-10 numerical systems are convenient for reasons of anatomy, they are not as mathematically practical as would be systems based on perhaps 11 or 12. Some mathematicians have suggested that a base-11 system would be preferable to a base-10 system because 11 is a prime number (and is thus divisible only by 1 and 11), while 10 is not a prime number (because it is divisible by 1, 2, 5, and 10); others have suggested that a base-12 system would be preferable to a base-10 system because 12 is divisible by more whole numbers (1, 2, 3, 4, 6, 12) than is 10.

2 Base-10 numerical systems were not the only systems based on anatomical parts: there were also systems based on 5 and 20. While it is difficult to find a number system that is a purely base-5, or quinary, system, it is possible to find number systems that have traces of groupings by fives, and these systems are most likely what remains of older systems that developed from counting the fingers on one hand. In a quinary system, there would be distinct units for numbers 1 through 5, but the words for numbers 6 through 9 are compounds of five-and-one, five-and-two, five-and-three, and so on. Remnants of quinary systems can be found today only in historical records of ancient languages, such as the language of the early Sumerians.

3 Examples of base-20, or vigesimal, systems, which most likely developed from counting by making use of all the digits, are more common than are those of base-5 systems. A number of early cultures, including the Mayans, the Aztecs, and the Celts, developed numerical systems that involved counting by 20s. The Mayan calendar had 20 months of 20 days each, and the Mayans counted years in terms of 20-year periods rather than decades; study of the Aztec numbers for 1 through 20 shows that the names of the first five numbers are related to the fingers of one hand, the names of the next five numbers are related to the fingers of the other hand, the names of the numbers 11 through 16 are related to the toes on one foot, and the names of numbers 16 through 20 are related to the toes on the other foot. In Celtic languages, counting is also done by 20s, and a number of other European languages maintain remnants of this characteristic. In French and Latin, the words for 20 are clearly remnants of a vigesimal system in that they are distinct words not derived from words for *two-tens,* which would occur in a purely base-10 system, and the way of expressing the number 80 is by counting by 20s and saying *four-twenties.* In English, the way of counting by 20s was to use the word *score*; this method of counting was commonly used by Shakespeare and was still in use at the time of Abraham Lincoln, who opened his famous address at Gettysburg by saying: "Four score and seven years ago. . . ."

4 Some cultures had systems based upon 60, a system with a major drawback in that it requires 60 distinct words for numbers 1 through 60. In Sumerian, Babylonian, Greek, and Arab cultures, for example, the sexagesimal system was a scholarly numerical system. Sexagesimal systems were obviously not developed based on body parts, and numerous theories have been raised to explain how such systems came about, but it is not know conclusively which of these theories is correct. One hypothesis is that 60 was chosen as the base because it is the lowest number with a great many divisors (1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60). Another

theory provides a more natural explanation for the use of 60 as a base: the approximate number of days in a year is 360, which supposedly led to the use of 360 degrees in a circle and was reduced to the more manageable 60, which is one-sixth of 360. A third theory suggests that the use of 60 as a base must have come about as a result of interchange between two different civilizations, one using a decimal (base 10) system and the other using a base-6 system. A weakness of this theory is that there is no historical foundation to support the existence of a base-6 system.

Refer to this version of the passage to answer the questions that follow.

Paragraph

Mathematical Bases

1 The system of numeration that is now most widely used is a base-10 system with the following characteristics: each number from 1 to 10 as well as the powers of 10 (such as one hundred or one thousand) has a distinctive name, and the names of the other numbers tend to be combinations of the names of the numbers from 1 to 10 and the powers of 10. In most Indo-European, Semitic, and Mongolian languages, the numerical systems have a decimal base and conform at least approximately to this theoretical model. The almost universal adoption of the base-10 numerical system was undoubtedly influenced by the fact that humans have ten fingers, since people most likely first learned to count on their fingers. Though the base-10 numerical systems are convenient for reasons of anatomy, they are not as mathematically practical as would be systems based on perhaps 11 or 12. Some mathematicians have suggested that a base-11 system would be preferable to a base-10 system because 11 is a prime number (and is thus divisible only by 1 and 11), while 10 is not a prime number (because it is divisible by 1, 2, 5, and 10); others have suggested that a base-12 system would be preferable to a base-10 system because 12 is divisible by more whole numbers (1, 2, 3, 4, 6, 12) than is 10.

2 Base-10 numerical systems were not the only systems based on anatomical parts: there were also systems based on 5 and 20. While it is difficult to find a number system that is a purely base-5, or quinary, system, it is possible to find number systems that have traces of groupings by fives, and these systems are most likely what remains of older systems that developed from counting the fingers on one hand. In a quinary system, there would be distinct units for numbers 1 through 5, but the words for numbers 6 through 9 are compounds of five-and-one, five-and-two, five-and-three, and so on. Remnants of quinary systems can be found today only in historical records of ancient languages, such as the language of the early Sumerians.

3 Examples of base-20, or vigesimal, systems, which most likely developed from counting by making use of all the digits, are more common than are those of base-5 systems. A number of early cultures, including the Mayans, the Aztecs, and the Celts, developed numerical systems that involved counting by 20s. The Mayan calendar had 20 months of 20 days each, and the Mayans counted years in terms of 20-year periods rather than decades; study of the Aztec numbers for 1 through 20 shows that the names of the first five numbers are related to the fingers of one hand, the names of the next five numbers are related to the fingers of the other hand, the names of the numbers 11 through 16 are related to the toes on one foot, and the names of numbers 16 through 20 are related to the toes on the other foot. In Celtic languages, counting is also done by 20s, and a number of other European languages maintain remnants of this characteristic. In French and Latin, the words for 20 are clearly remnants of a vigesimal system in that they are distinct words not derived from words for *two-tens,* which would occur in a purely base-10 system, and the way of expressing the number 80 is by counting by 20s and saying *four-twenties.* In English, the way of counting by 20s was to use the word *score;* this method of counting was commonly used by Shakespeare and was still in use at the time of Abraham Lincoln, who opened his famous address at Gettysburg by saying: "Four score and seven years ago. . . ."

4 Some cultures had systems based upon 60, a system with a major drawback in that it requires 60 distinct words for numbers 1 through 60. 36A In Sumerian, Babylonian, Greek, and Arab cultures, for example, the sexagesimal system was a scholarly numerical system. 36B Sexagesimal systems were obviously not developed based on body parts, and numerous theories have been raised to explain how such systems came about, but it is not know conclusively which of these theories is correct. 36C One hypothesis is that 60 was chosen as the base because it is the lowest number with a great many divisors (1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60). 36D Another theory provides a more natural explanation for the use of 60 as a base: the approximate number of days in a year is 360, which supposedly led to the use of 360 degrees in a circle and was reduced to the more manageable 60, which is one-sixth of 360. A third theory suggests that the use of 60 as a base must have come about as a result of interchange between two different civilizations, one using a decimal (base 10) system and the other using a base-6 system. A weakness of this theory is that there is no historical foundation to support the existence of a base-6 system.

Questions

27. The phrase of anatomy in paragraph 1 is closest in meaning to

Ⓐ related to mathematical precision
Ⓑ related to the history of the language
Ⓒ related to the structure of the body
Ⓓ related to ease of counting

28. Which of the sentences below expresses the essential information in the highlighted sentence in paragraph 1? *Incorrect* choices change the meaning in important ways or leave out essential information.

Ⓐ It has been suggested that either base 11 or base 12 would be preferable to base 10, for opposite reasons.
Ⓑ The number 10 has fewer divisors than the number 11 but more divisors than the number 12.
Ⓒ All mathematicians agree that a numerical system based on a number with the most divisors would be the best system.
Ⓓ Mathematicians have suggested that either base 11 or base 12 would be better than base 10 because both 11 and 12 are prime numbers.

29. The author begins paragraph 2 by mentioning Base-10 numerical systems in order to

Ⓐ introduce a new topic in paragraph 2
Ⓑ indicate that base-10 systems are based on anatomy, while other systems are not
Ⓒ emphasize that base-10 systems were less common than other systems
Ⓓ relate the topic of paragraph 1 to the topic of paragraph 2

30. The word traces in paragraph 2 could best be replaced by

Ⓐ remnants
Ⓑ tracks
Ⓒ results
Ⓓ processes

31. The word digits in paragraph 3 could best be replaced by

Ⓐ hands
Ⓑ numbers
Ⓒ fingers and toes
Ⓓ measurements

32. The phrase this characteristic in paragraph 3 refers to

Ⓐ using Celtic words
Ⓑ counting by 20s
Ⓒ relating the names of numbers to the toes
Ⓓ counting on the toes of one foot

33. The passage indicates that all of the following languages show characteristics of a vigesimal system EXCEPT

Ⓐ Latin
Ⓑ Celtic
Ⓒ English
Ⓓ Greek

34. It can be determined from paragraph 3 that four score and seven is equal to

Ⓐ 47
Ⓑ 87
Ⓒ 327
Ⓓ 749

35. The word drawback in paragraph 4 is closest in meaning to

Ⓐ disadvantage
Ⓑ attraction
Ⓒ reversal
Ⓓ interest

36. Look at the four squares [■] that indicate where the following sentence can be added to paragraph 4.

It was one that was used mainly for scientific study and analysis.

Click on a square [■] to add the sentence to the passage.

37. The word interchange in paragraph 4 is closest in meaning to

Ⓐ barter
Ⓑ absorption
Ⓒ finance
Ⓓ contact

38. The number 25 would most likely be

Ⓐ a distinct number from 1 through 24 in a quinary system
Ⓑ a variation of *five-fives* in a decimal system
Ⓒ a variation of *twenty-plus-five* in a vigesimal system
Ⓓ a variation of *two-tens-plus-five* in a sexagesimal system

39.

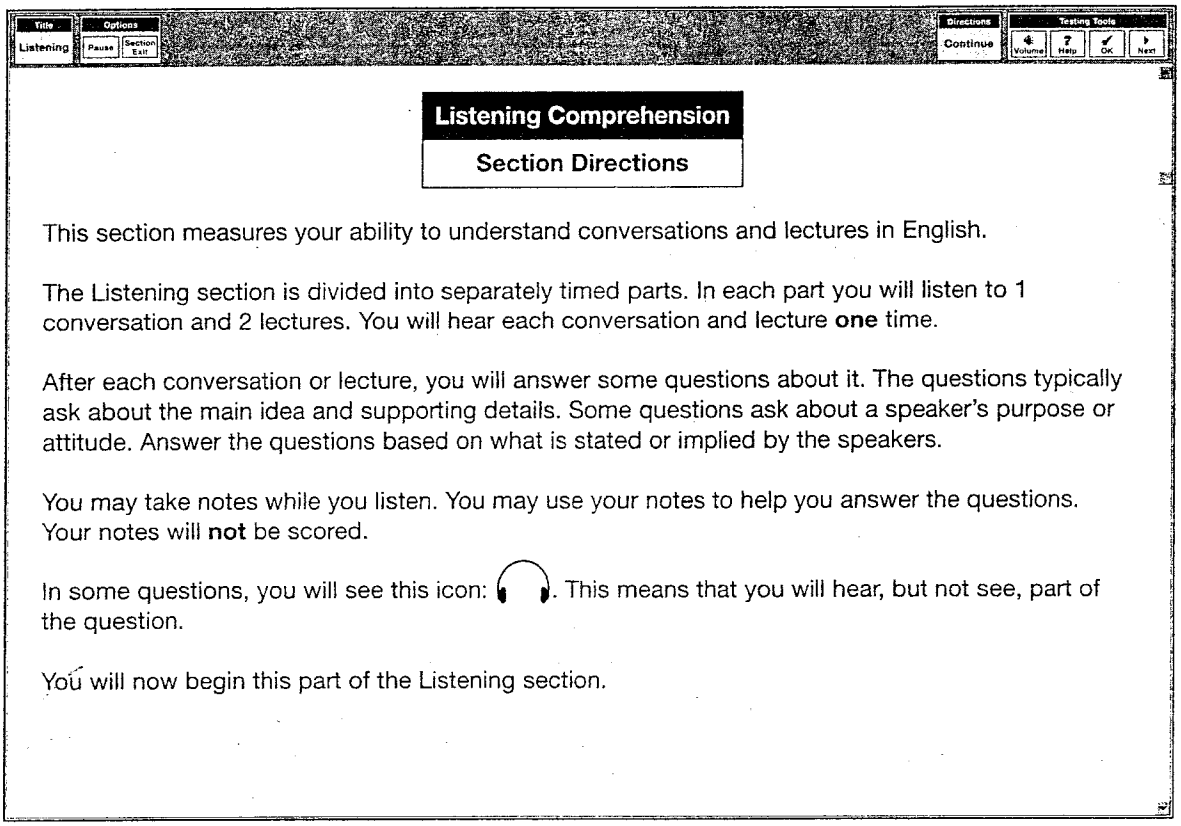
Directions: Two of the answer choices below are used to describe each of the numerical systems. Complete the table by matching appropriate answer choices to the numerical systems they are used to describe. ***This question is worth 4 points.***	
quinary system	• •
decimal system	• •
vigesimal system	• •
sexagesimal system	• •

Answer Choices (choose 8 to complete the chart):

(1) Most likely based on the fingers of one hand
(2) The most commonly used system
(3) Most likely based on the fingers and toes
(4) Most likely not based on the fingers and toes
(5) Most likely based on the toes on both feet
(6) Remnants found in some of today's languages
(7) Came about as a result of the merging of two different numerical systems
(8) Remnants found only in ancient languages
(9) Not know to have been used by the masses in any culture
(10) Most likely based on the fingers on both hands

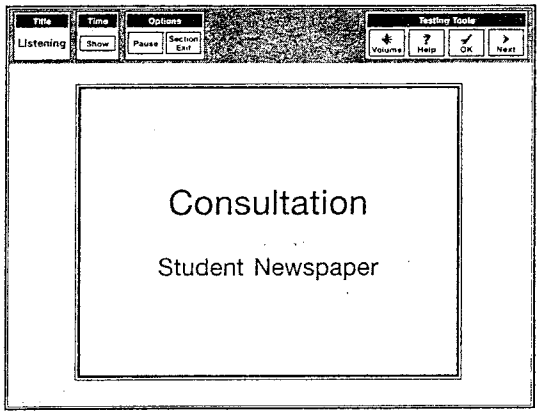
Turn to the chart on page 544, and circle the numbers of the questions that you missed.

LISTENING


Title
Listening
Options
Pause
Section
Directions
Continue
Testing Tools
Volume
Help
OK
Next
Listening Comprehension
Section Directions
This section measures your ability to understand conversations and lectures in English.
The Listening section is divided into separately timed parts. In each part you will listen to 1 conversation and 2 lectures. You will hear each conversation and lecture one time.
After each conversation or lecture, you will answer some questions about it. The questions typically ask about the main idea and supporting details. Some questions ask about a speaker's purpose or attitude. Answer the questions based on what is stated or implied by the speakers.
You may take notes while you listen. You may use your notes to help you answer the questions. Your notes will not be scored.
In some questions, you will see this icon: . This means that you will hear, but not see, part of the question.
You will now begin this part of the Listening section.

Questions 1–5

Listen to a conversation between a student and a university office worker.



1. Why does the student go to this university office?

Ⓐ To find out about writing for the school paper
Ⓑ To get a copy of the student paper
Ⓒ To sign up for a journalism course
Ⓓ To apply for a job as an editor

2. Is each of these true about the student's experience?

For each statement, click in the YES or NO column.

	YES	NO
She has worked on the high school paper.		
She has worked on the university school paper.		
She has taken a high school journalism course.		
She has taken a university journalism course.		
She has been an editor on the high school paper.		
She has been an editor on the university paper.		

3. Listen again to part of the passage. Then answer the question.

Why does the office worker say this:

Ⓐ To try to convince the student to change her mind
Ⓑ To verify that what the student just said was accurate
Ⓒ To encourage the student
Ⓓ To correct something he just said

4. What must a student do to become a staff writer on the university paper?

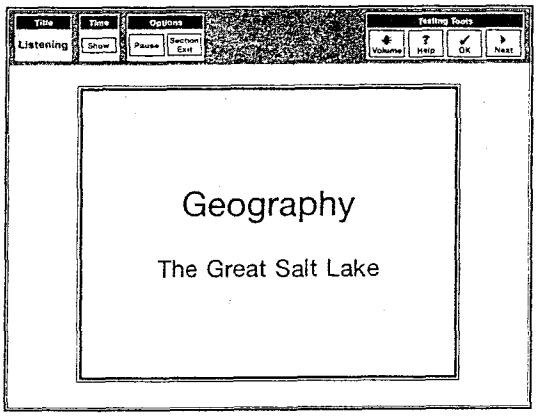
Ⓐ Submit three articles about any single aspect of the student's life
Ⓑ Submit any articles he or she has written for other papers
Ⓒ Submit one article about his or her experience as a writer
Ⓓ Submit three articles he or she has written about different aspects of student life

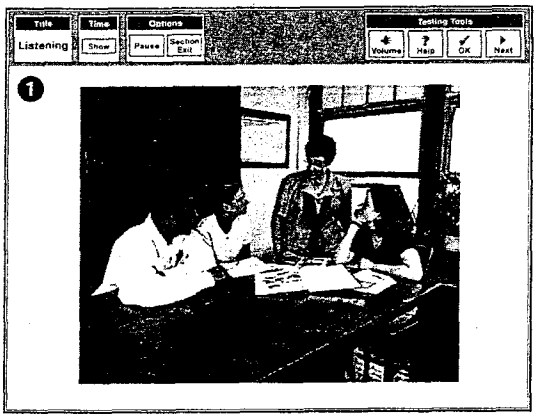
5. What will the student most likely do next?

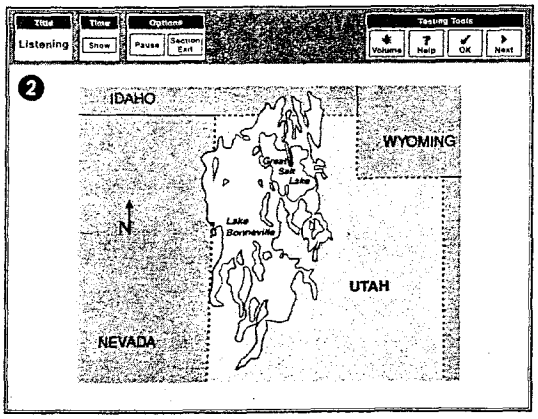
Ⓐ Turn in some of her high school articles
Ⓑ Turn in some university articles tomorrow
Ⓒ Forget about joining the paper
Ⓓ Take some time to write the articles carefully

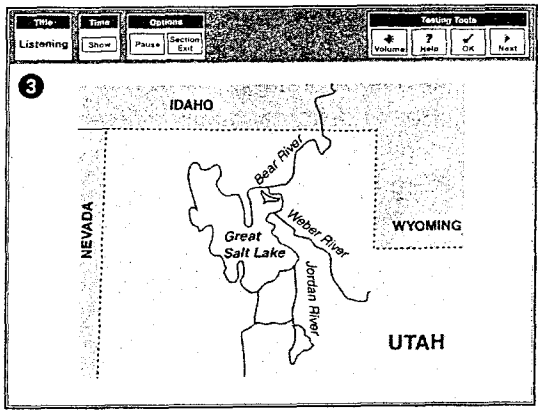
Questions 6–11

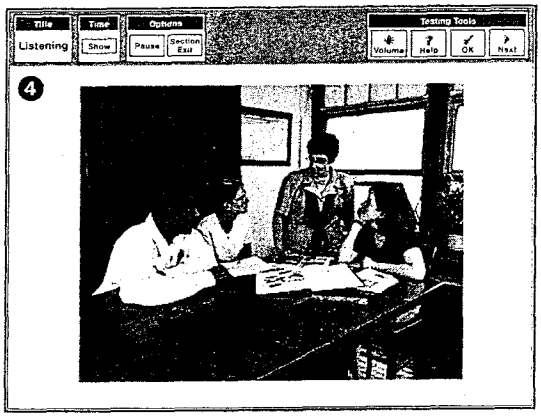
Listen to a discussion from a geography class.











6. What is the instructor trying to accomplish?

Ⓐ She is outlining the history of a particular area.
Ⓑ She is describing how different types of lakes function.
Ⓒ She is comparing and contrasting two related lakes.
Ⓓ She is explaining how two different lakes developed distinctly.

7. When did Lake Bonneville come into existence?

Ⓐ 10,000 years ago
Ⓑ 100,000 years ago
Ⓒ 1,000,000 years ago
Ⓓ 10,000,000 years ago

8. Listen again to part of the passage. Then answer the question.

What does the instructor mean when she says this:

Ⓐ "Take more time to answer if you want."
Ⓑ "I think your answer is not correct."
Ⓒ "You didn't say anything; please say something."
Ⓓ "I think you're not very sure of yourself."

9. What is stated in the lecture about each lake?

For each statement, click in the correct column.

	Lake Bonneville	Great Salt Lake
It is a 20,000-square-mile lake.		
It is a freshwater lake.		
It is the older lake.		
It is the lake with no outlet.		

10. What is stated about the Weber, the Bear, and the Jordan Rivers?

Click on 2 answers.

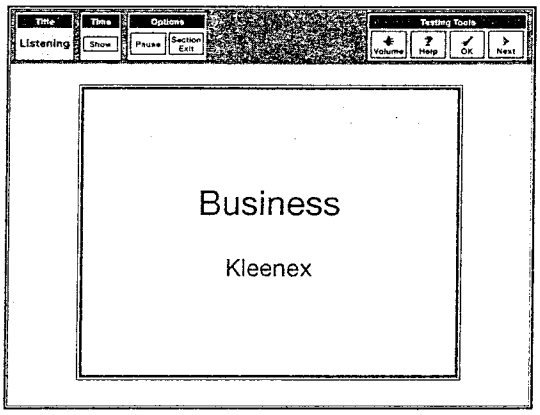
[A] They feed into the Great Salt Lake.
[B] They carry deposits out of the Great Salt Lake.
[C] They are saltier than the Great Salt Lake.
[D] They bring a million tons of deposits into the Great Salt Lake each year.

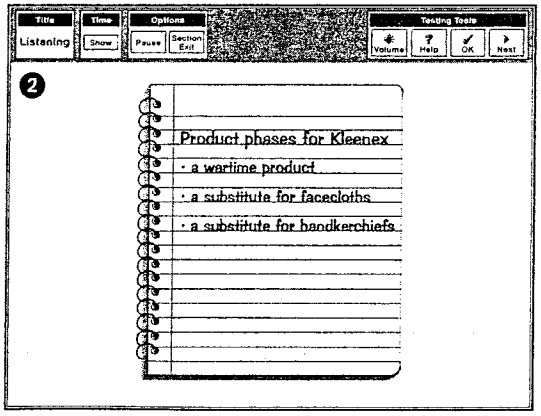
11. How much salt has built up in the Great Salt Lake?

Ⓐ 6 tons
Ⓑ 600 tons
Ⓒ 6 million tons
Ⓓ 6 billion tons

Questions 12–17

Listen to a group of students who are taking a business class.





12. Why are the students meeting?

Ⓐ They are reviewing class lecture notes.
Ⓑ They are preparing for a presentation.
Ⓒ They are working on a paper.
Ⓓ They are preparing for an exam.

13. Listen again to part of the discussion. Then answer the question.

Why does the man say this:

Ⓐ He thinks the marketing of the products is not as important as the history.
Ⓑ He is afraid the other students do not know what course they are taking.
Ⓒ He is concerned that the presentation does not have the correct focus.
Ⓓ He would like to remind the others that they are taking two different courses.

14. With what product was each of these periods of time associated?

For each period of time, click in the correct column.

	Facecloths	Bandages	Handkerchiefs
Before 1920			
In the 1920s			
In the 1930s			

15. What was the situation at Kimberly-Clark at the end of World War I?

Click on 2 answers.

[A] It had a surplus of its product.
[B] It needed to develop a new product.
[C] It no longer needed to market its product.
[D] It needed to begin marketing its product.

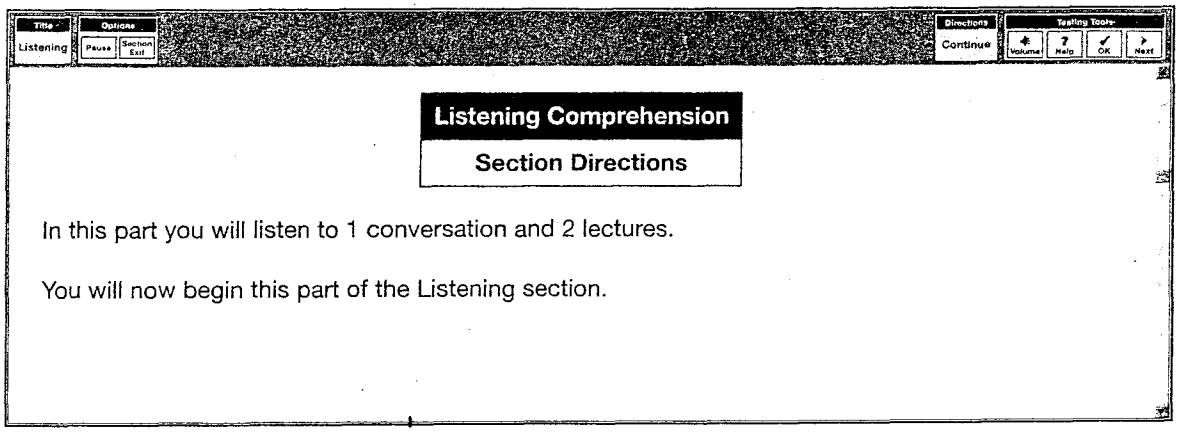
16. How did Kimberly-Clark learn that its product had a use as a handkerchief?

Ⓐ From customer letters
Ⓑ From research scientists
Ⓒ From marketing experts
Ⓓ From famous actresses

17. With what product was each of these marketing strategies associated?

For each marketing strategy, click in the correct column.

	Facecloths	Bandages	Handkerchiefs
Consumer testing			
No marketing			
Famous actresses			



Listening Comprehension

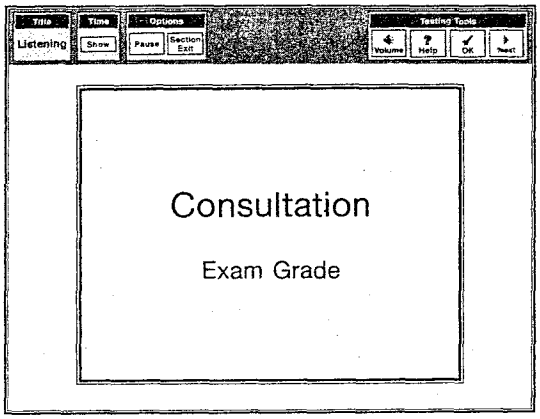
Section Directions

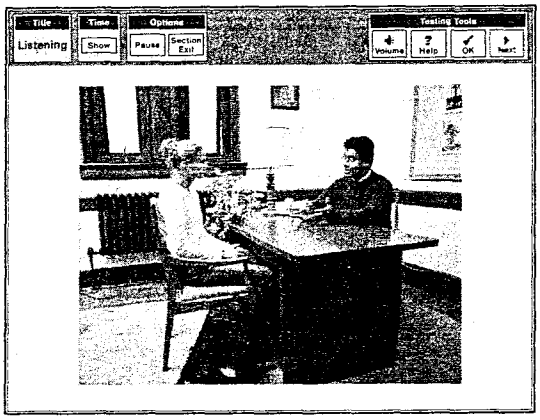
In this part you will listen to 1 conversation and 2 lectures.

You will now begin this part of the Listening section.

Questions 18–22

Listen to a conversation between a student and a professor.





18. Why does the student go to see the professor?

Ⓐ To talk about how to prepare for a coming exam
Ⓑ To figure out why she did not do well on an exam
Ⓒ To discuss the answer to an exam question
Ⓓ To find out how the professor wants her to evaluate information

19. How had the student most likely prepared for the exam?

Ⓐ She had most likely not studied at all.
Ⓑ She had most likely studied only a little.
Ⓒ She had most likely spent a lot of time memorizing information.
Ⓓ She had most likely prepared the way that the professor wanted.

20. What problem did the student have with the question regarding the process?

Ⓐ She did not know what the process was.
Ⓑ She did not know what the steps in the process were.
Ⓒ She did not list all of the steps in the process.
Ⓓ She failed to evaluate the steps in the process.

21. What problem did the student have with the question regarding the theories?

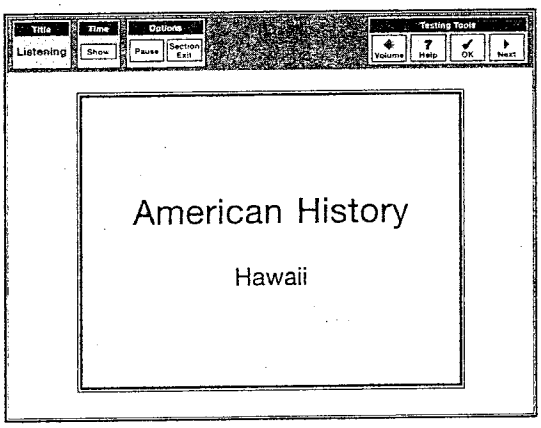
Ⓐ She did not know what the theories were.
Ⓑ She wrote about only one of the theories.
Ⓒ She stated incorrect information about the theories.
Ⓓ She did not clearly compare and contrast the theories.

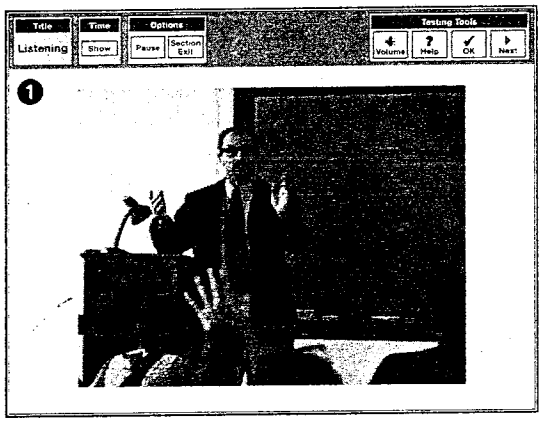
22. Which exam question would this professor most likely use?

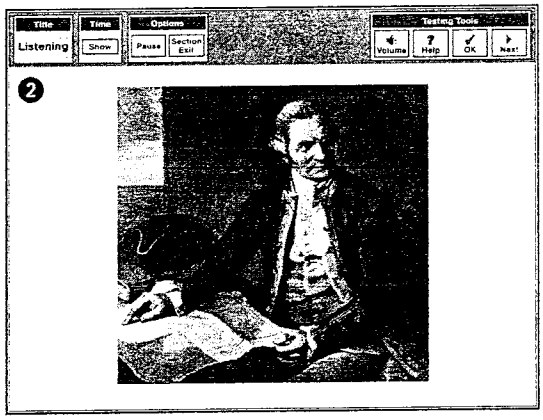
Ⓐ What are the key points of a certain policy?
Ⓑ Who supports a certain policy?
Ⓒ What are the strengths and weaknesses of a certain policy?
Ⓓ When was a certain policy developed?

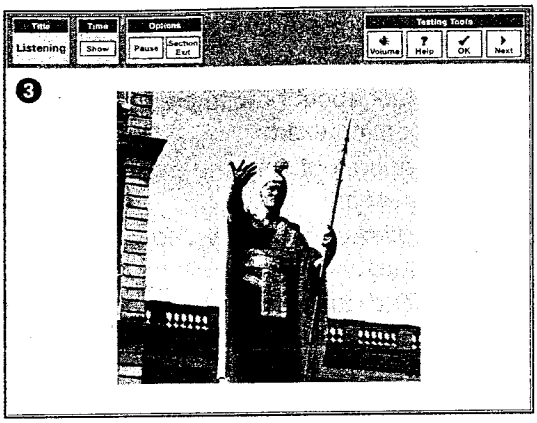
Questions 23–28

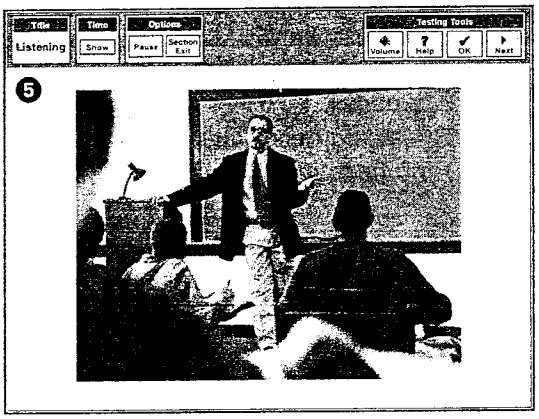
Listen to a lecture in an American history class.











23. What does the lecturer mainly discuss?

Ⓐ The role of Captain Cook in the history of Hawaii
Ⓑ How the Hawaiian monarchy came to be
Ⓒ Events leading up to the end of the Hawaiian monarchy
Ⓓ The queen who built up the Hawaiian monarchy

24. Why does the lecturer most likely mention King Kamehameha and Captain Cook?

Ⓐ They played important roles in the history of Hawaii leading up to Liliuokalani.
Ⓑ They succeeded in convincing Liliuokalani to change what she was doing.
Ⓒ They were both instrumental in causing the monarchy of Hawaii to fall.
Ⓓ They were in Hawaii at the time that the monarchy was established there.

25. What does the professor say about James Cook?

Ⓐ He was the Earl of Sandwich.
Ⓑ He fought to unite the islands under one king.
Ⓒ He served as one of the kings of Hawaii.
Ⓓ He named the islands after a British earl.

26. What did Liliuokalani believe, according to the professor?

Ⓐ That the monarchy should end
Ⓑ That the monarch's power should be limited
Ⓒ That someone else should be the monarch
Ⓓ That the monarch should have complete power

27. Which of the following did NOT happen to Liliuokalani?

Ⓐ She became queen in 1891.
Ⓑ She ruled Hawaii until the end of her life.
Ⓒ She received a pension from the government.
Ⓓ She was removed from power.

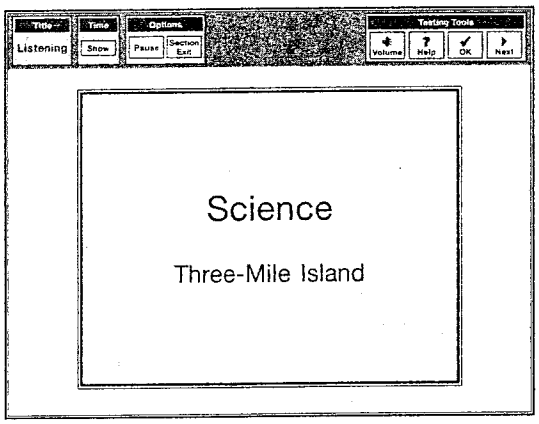
28. When did each person live?

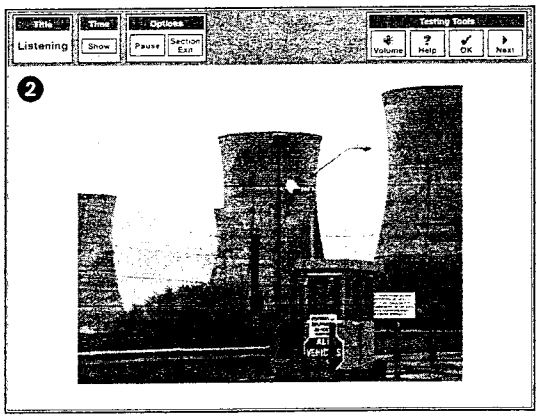
For each person, click in the correct column.

	End of the 18th century	Beginning of the 19th century	End of the 19th century
Kamehameha			
James Cook			
Liliuokalani			

Questions 29–34

Listen to a lecture in a science class.





29. What is the main topic of the lecture?

Ⓐ The causes of an accident
Ⓑ The history of a nuclear power plant
Ⓒ An accident and its effects
Ⓓ The construction of the reactors at Three-Mile Island

30. How many pressurized water reactors are there at Three-Mile Island?

Ⓐ One
Ⓑ Two
Ⓒ Three
Ⓓ Four

31. What does the lecturer say about the PWRs during the accident?

Ⓐ There were no problems with the PWRs.
Ⓑ There was a problem with only one of the PWRs.
Ⓒ There were problems with one PWR after another.
Ⓓ There were problems with more than one PWR.

32. Did each of these happen during the accident discussed in the lecture?

For each statement, click in the YES or NO column.

	YES	NO
A cooling valve was stuck closed.		
Instruments were misread.		
The emergency cooling was turned on.		
A partial meltdown occurred.		

33. What is stated in the lecture about a complete meltdown?

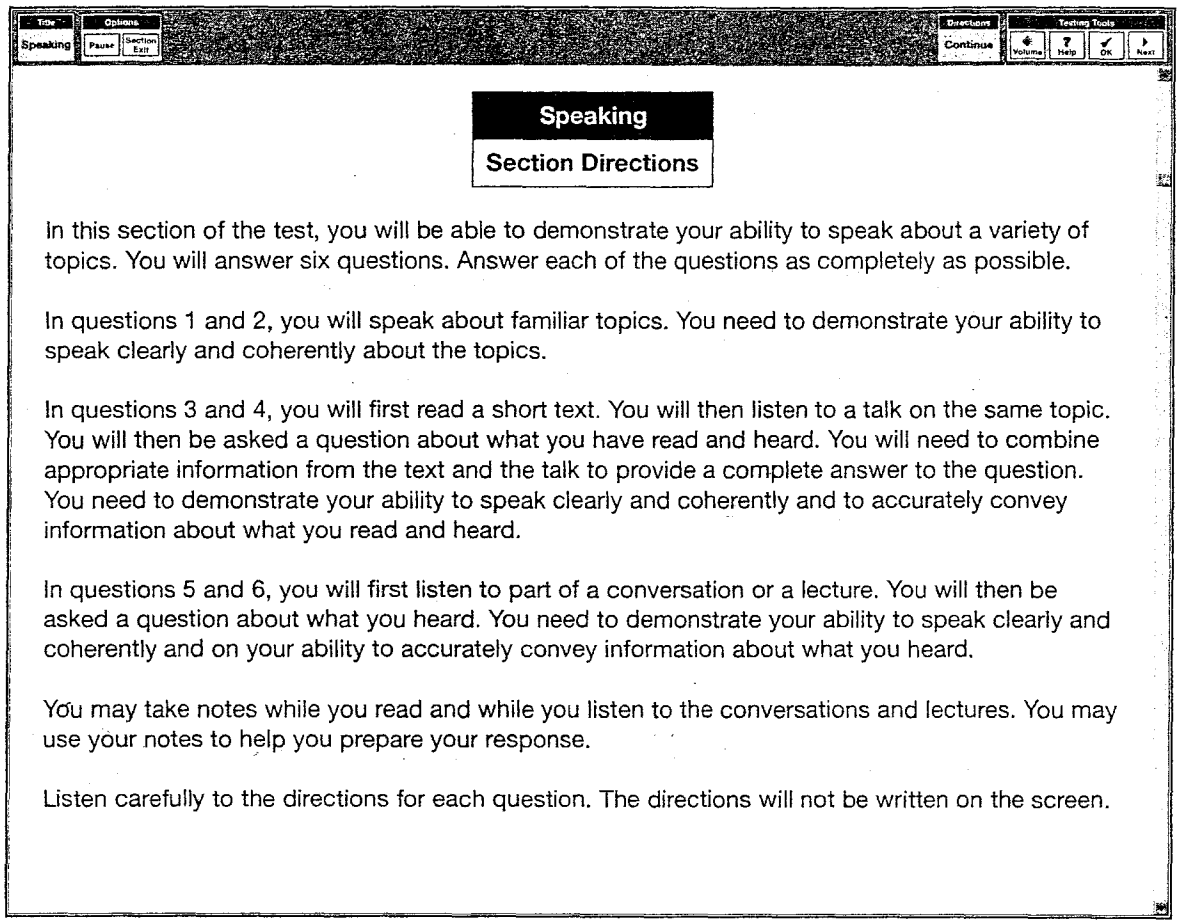
Ⓐ One occurred at Three-Mile Island.
Ⓑ One occurs if uranium begins to melt.
Ⓒ It requires the emergency water cooling system to be turned on.
Ⓓ It involves the complete meltdown of the uranium in the fuel core.

34. How does the lecturer seem to feel about the accident at Three-Mile Island?

Ⓐ It was not at all serious.
Ⓑ Its seriousness was extremely exaggerated.
Ⓒ It was not as serious as it could have been.
Ⓓ It was quite catastrophic.

Turn to the chart on page 545, and circle the numbers of the questions that you missed.

SPEAKING


Title
Speaking
Options
Pause
Section Exit
Directions
Continue
Testing Tools
Volume
Help
OK
Next
Speaking
Section Directions
In this section of the test, you will be able to demonstrate your ability to speak about a variety of topics. You will answer six questions. Answer each of the questions as completely as possible.
In questions 1 and 2, you will speak about familiar topics. You need to demonstrate your ability to speak clearly and coherently about the topics.
In questions 3 and 4, you will first read a short text. You will then listen to a talk on the same topic. You will then be asked a question about what you have read and heard. You will need to combine appropriate information from the text and the talk to provide a complete answer to the question. You need to demonstrate your ability to speak clearly and coherently and to accurately convey information about what you read and heard.
In questions 5 and 6, you will first listen to part of a conversation or a lecture. You will then be asked a question about what you heard. You need to demonstrate your ability to speak clearly and coherently and on your ability to accurately convey information about what you heard.
You may take notes while you read and while you listen to the conversations and lectures. You may use your notes to help you prepare your response.
Listen carefully to the directions for each question. The directions will not be written on the screen.

Questions 1–6

Question 1

Read the question. On a piece of paper, take notes on the main points of a response. Then respond to the question.

> What would be your dream job? Use reasons and details to support your reponse.
>
> Preparation Time: 15 seconds
> Response Time: 45 seconds

Question 2

Read the question. On a piece of paper, take notes on the main points of a response. Then respond to the question.

> Would you prefer to write a paper by yourself or with a group? Use reasons and details to support your response.
>
> Preparation Time: 15 seconds
> Response Time: 45 seconds

Question 3

Read the passage. On a piece of paper, take notes on the main points of the reading passage.

Reading Time: 45 seconds

Announcement from the music department

The Spring Show is an annual program of vocal and instrumental music to celebrate the spring season. Tickets for this fantastic event will go on sale for students at 9:00 A.M. on Monday, March 1 at the music auditorium ticket office. Any tickets that are still available will go on sale to the public on Monday, March 8. Get your tickets early for this fabulous annual event because they always sell out soon after they go on sale to the public. Get your tickets early so that you will not have to miss out on this fabulous event.

Listen to the passage. On a piece of paper, take notes on the main points of the listening passage.

Now answer the following question:

How do the students react to the notice about the Spring Show?

Preparation Time: 30 seconds
Response Time: 60 seconds

Question 4

Read the passage. On a piece of paper, take notes on the main points of the reading passage.

Reading Time: 45 seconds

Great Ape Communication

Quite a few scientific studies have been conducted on communication by the great apes, a group of primates composed of gorillas, chimpanzees, and orangutans. What has been concluded in these studies is that the great apes communicate in a variety of ways that include, but are not limited to, facial expressions, gestures with their appendages, and a variety of calls. The large primates use this wide variety of methods of communication to express a broad range of ideas to other members of their group, such as anger, fear, approaching danger, dominance over the group, or acceptance of members into the group.

Listen to the passage. On a piece of paper, take notes on the main points of the listening passage.

Now answer the following question:

How does the information in the listening passage add to what is explained in the reading passage?

Preparation Time: 30 seconds
Response Time: 60 seconds

Question 5

Listen to the passage. On a piece of paper, take notes on the main points of the listening passage.

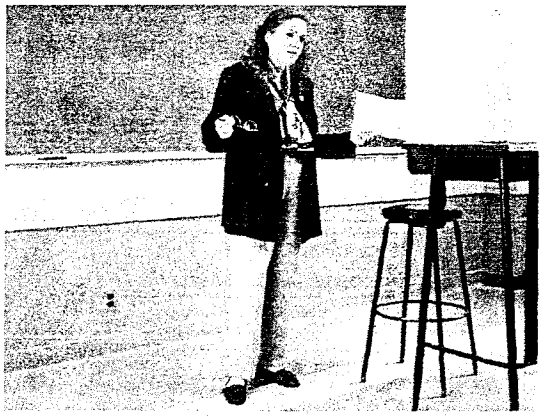
Now answer the following question:

How is the woman dealing with the problem she is facing?

Preparation Time: 20 seconds
Response Time: 60 seconds

Question 6

Listen to the passage. On a piece of paper, take notes on the main points of the listening passage.



Now answer the following question:

How does the professor describe mercantilism?

Preparation Time: 20 seconds
Response Time: 60 seconds

After you have completed this test, fill in the chart on pages 546–551.

WRITING

Writing

Section Directions

This section measures your ability to use writing to communicate in an academic environment. There will be two writing tasks.

For the first writing task, you will read a passage and listen to a lecture and then answer a question based on what you have read and heard. For the second task, you will answer a question based on your own knowledge and experience.

Integrated Writing Directions

For the first task, you will read a passage about an academic topic. You will have **3 minutes** to read the passage. You may take notes on the passage while you read. The passage will then be removed and you will listen to a lecture about the same topic. While you listen, you may also take notes.

Then you will write a response to a question that asks you about the relationship between the lecture you heard and the reading passage. Try to answer the question as completely as possible using information from the reading passage and the lecture. The question does **not** ask you to express your personal opinion. You will be able to see the reading passage again when it is time for you to write. You may use your notes to help you answer the question. You will have **20 minutes** to write your response.

Typically, an effective response will be 150 to 225 words. You need to demonstrate your ability to write well and to provide complete and accurate content.

Remember you can look at the passage again when you write your response. Immediately after the reading time ends, the lecture begins.

Independent Writing Directions

For the second task, you will write an essay in response to a question that asks you to state, explain, and support your opinion on an issue. You will have **30 minutes** to plan, write, and revise your response.

Typically, an effective essay will contain a minimum of 300 words. You need to demonstrate your ability to write well. This includes the development of your ideas, the organization of your essay, and the quality and accuracy of the language you use to express your ideas.

Question 1

Read the passage. On a piece of paper, take notes on the main points of the reading passage.

Reading Time: 3 minutes

Originally named after the Roman goddess of love, the planet Venus also used to be known as the morning star and the evening star because it shines so brightly that it is visible on Earth even when the Sun is only partially visible in the morning and the evening.

Why does Venus shine so brightly? One reason is certainly because Venus is so close to Earth; it is, in fact, the closest planet to Earth. However, its proximity to Earth is not the only reason that Venus appears to shine so brightly. Another reason that Venus shines so brightly is that it is covered in thick white clouds that reflect sunlight off of them.

For quite some time, all that we have been able to see of Venus is the thick clouds that surround it, and little else was known of the planet itself. Dozens of space probes were sent to Venus in the last part of the twentieth century, and most of them were destroyed before they were able to send back information about Venus's surface. One probe, however, did manage to transmit some messages before it, too, failed.

From this one partially successful probe, numerous amazing facts about Venus have been learned. The thick clouds that cover Venus, for example, are made of sulfuric acid rather than oxygen, and these thick clouds never part to let any sunshine in at all. Most amazingly, the temperature on Venus is extremely hot, somewhere around 900 degrees Fahrenheit.

Listen to the passage. On a piece of paper, take notes on the main points of the listening passage.

Now answer the following question:

How does the information in the listening passage expand on the information presented in the reading passage?

Preparation Time: 1 minute
Response Time: 20 minutes

Question 2

Read the question. On a piece of paper, take notes on the main points of a response. Then write your response.

> Many families have important traditions that family members share. What is one of your family's important traditions? Use specific reasons and details to support your response.

Response Time: 30 minutes

After you have completed this test, fill in the chart on pages 552–553.