



ENGLISH TEST QUESTIONS

Click on the letter choices to determine if you have the correct answer and for question explanations.
(An actual ACT English Test contains 75 questions to be answered in 45 minutes.)

DIRECTIONS: In the passage that follows, certain words and phrases are underlined and numbered. In the right-hand column, you will find alternatives for the underlined part. In most cases, you are to choose the one that best expresses the idea, makes the statement appropriate for standard written English, or is worded most consistently with the style and tone of the passage as a whole. If you think the original version is best, choose "NO CHANGE." In some cases, you will find in the right-hand column a question about the underlined part. You are to choose the best answer to the question.

You will also find questions about a section of the passage, or about the passage as a whole. These questions do not refer to an underlined portion of the passage, but rather are identified by a number or numbers in a box.

For each question, choose the alternative you consider best and fill in the corresponding oval on your answer document. Read the passage through once before you begin to answer the questions that accompany it. For many of the questions, you must read several sentences beyond the question to determine the answer. Be sure that you have read far enough ahead each time you choose an alternative.

Tuning In During the Twenties

[1]

Modern broadcasting began to develop after the First World War. Before 1920, radio was simply a useful way to send electrical signals ashore from a ship at sea, or,
1 from one "ham" operator to another.

The new technology associated with movies and airplanes was already developing rapidly by the time soldiers started returning from European trenches in 1918. The vast potential of the airwaves, therefore,
2 had scarcely been touched.

[2]

[1] Then a vice president of Westinghouse, looking for a way to make the transmission of radio

- | | |
|--------------|------------------|
| 1. <u>A.</u> | NO CHANGE |
| <u>B.</u> | ship, at sea, or |
| <u>C.</u> | ship at sea or; |
| <u>D.</u> | ship at sea or |
| 2. <u>F.</u> | NO CHANGE |
| <u>G.</u> | however, |
| <u>H.</u> | also, |
| <u>J.</u> | in fact, |

signals more profitable, decided
3 on a two-fold

strategy. [2] First, he would entice an audience with daily programming of great variety. [3] Second, he would sell this audience the radio receivers necessary

to listen to this entertainment. [4] The plan succeeded
4

beyond anyone's expectations. [5]

[3]

The federal Radio Division in Washington, D.C.,

was created to license stations, because
6 it had no power to regulate them. Broadcasters multiplied wildly, some helping themselves to the more desirable frequencies, others increasing their transmission

power at will. Chaos means things were out of control.
7

[4]

Yet even in the midst of such anarchy,

some commercial possibilities and organizations

3. A. NO CHANGE
B. but had a decision
C. deciding
D. yet decided

4. F. NO CHANGE
G. successful planning was
H. success plan was
J. plans succeeding

5. Which of the following sequences of sentences will make Paragraph 2 most logical?

- A. NO CHANGE
B. 1, 4, 3, 2
C. 2, 1, 3, 4
D. 4, 1, 2, 3

6. F. NO CHANGE
G. since
H. thus
J. but

7. Which of the alternatives provides the most logical and succinct conclusion for Paragraph 3?

- A. NO CHANGE
B. Chaos reigned.
C. There were some problems.
D. The government was always in control.

saw clearly

s

of a medium whose regulation seemed

imminent. In 1926, RCA paid the American

Telephone & Telegraph Company one million dollars

for station WEAJ in New York City—and NBC was

Years later,

born. 9 the Radio Law of 1927 was

it's control for

it

licensing and of policing

enacted. It authorized

the broadcasters.

[5]

who

The RCA executives ii created the

powerful NBC network were right to see that

sizable profits would come from this new medium.

Even in 1930 for example

it

an hour's advertising on

nationwide radio to forty-seven cities cost \$10,180.

Advertising turned broadcasting into an industry,

and the untapped potential of the airwaves

began to be realized.

it

8. F. NO CHANGE

G. some saw clearly the commercial possibilities and organizations

H. some organizations saw clearly the commercial possibilities

J. organizations saw clearly some possible commercials

9. A. NO CHANGE

B. A year later,

C. Factually,

D. In conclusion,

10. F. NO CHANGE

G. controlling

H. the control of

J. OMIT the underlined portion.

11. A. NO CHANGE

B. which

C. having

D. as

12. F. NO CHANGE

G. Even in 1930; for example

H. Even, in 1930 for example,

J. Even in 1930, for example,

13. A. NO CHANGE

B. begins realizing it.

C. began reality.

D. began it's realizing.

Questions 14 and 15 ask about the preceding passage as a whole.

14. The writer wishes to add the following sentence to the essay:

Nowadays, no matter where you are, it's hard to be far from a radio.

If added, this sentence would best support and most logically be placed:

- F. before the first sentence of Paragraph 2.
- G. after the last sentence of Paragraph 2.
- H. before the last sentence of Paragraph 3.
- J. after the last sentence of Paragraph 4.

15. The writer has been asked to write an essay assessing the development of modern technologies after the First World War. Would this essay fulfill that assignment?

- A. Yes; the writer focuses exclusively on the commercial possibilities of radio.
- B. Yes; the writer focuses on the need for federal regulation in the world of broadcasting.
- C. No; the writer focuses on the commercial possibilities of radio, just one technology.
- D. No; the writer focuses on the contrast between early radio and radio broadcasting of today.



MATHEMATICS TEST QUESTIONS

Click on the letter choices to determine if you have the correct answer
and for question explanations.

(An actual ACT Mathematics Test contains 60 questions to be answered in 60 minutes.)

DIRECTIONS: Solve each problem, choose the correct answer, and then fill in the corresponding oval on your answer document.

Do not linger over problems that take too much time. Solve as many as you can; then return to the others in the time you have left for this test.

You are permitted to use a calculator on this test. You may use your calculator for any problems you choose, but some of the problems may best be done without using a calculator.

Note: Unless otherwise stated, all of the following should be assumed.

1. Illustrative figures are NOT necessarily drawn to scale.
2. Geometric figures lie in a plane.
3. The word *line* indicates a straight line.
4. The word *average* indicates arithmetic mean.

1. Which of the following is equal to $\sqrt{20}$?

A. $2\sqrt{5}$

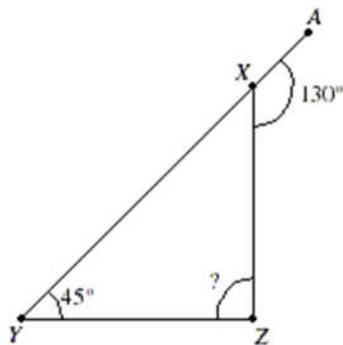
B. $2\sqrt{10}$

C. $4\sqrt{5}$

D. 10

E. $10\sqrt{2}$

2. In the figure below, X is on \overline{AY} , $\angle XYZ$ measures 45° , and $\angle AXZ$ measures 130° . What is the measure of $\angle XZY$?



- F. 45°
- G. 60°
- H. 85°
- J. 95°
- K. 105°

3. What is the slope of the line $5y = -3x + 10$?

- A. -3
- B. $-\frac{3}{5}$
- C. $\frac{5}{3}$
- D. 2
- E. 10

4. What is the least value of x that satisfies the equation $x^2 - 7x + 6 = 6$?

- F. -7
- G. -6
- H. -4
- J. 0
- K. 1

5. A box of cereal contains $18\frac{3}{4}$ cups of cereal. At most, how many persons can you serve from this box of cereal if each serving must be at least $\frac{3}{4}$ cup?

A. 14

B. 18

C. 19

D. 24

E. 25

6. What is the largest possible product for 2 even integers whose sum is 34 ?

F. 64

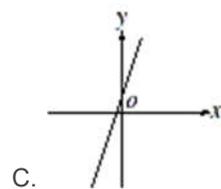
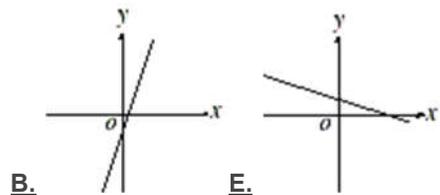
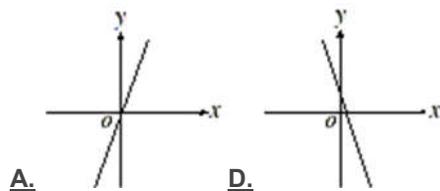
G. 68

H. 120

J. 240

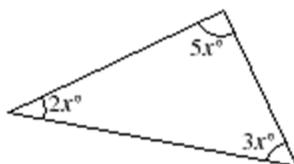
K. 288

7. In the graphs below, all axes have the same scale. One of the graphs shows $y = 3x + 1$. Which is that graph?



8. The measures of the angles of a triangle are in the ratio of $2x:3x:5x$ as illustrated below. What is

the measure of the smallest angle in the triangle?



F. 18°

G. 20°

H. 30°

J. 36°

K. 40°

9. There are n students in a class. If, among those students, $p\%$ play at least 1 musical instrument, which of the following general expressions represents the number of students who play NO musical instrument?

A. np

B. $.01np$

C. $\frac{(100-p)n}{100}$

D. $\frac{(1-p)n}{.01}$

E. $100(1-p)n$

10. If $x + 2y = 1$, and $2x + y = 5$, then $x + y = ?$

F. 1

G. 2

H. 3

J. 4

K. 5

11. What integer most nearly approximates $(\sqrt{50})(\sqrt{80})$?

A. 20

B. 40

C. 63

D. 200

E. 2,000

12.

Over all real numbers x , what is the maximum value of $4 \sin 3x$?

F. 1

G. $\frac{2\pi}{3}$

H. 3

J. 4

K. 12

READING TEST QUESTIONS

Click on the letter choices to determine if you have the correct answer and for question explanations.

(An actual ACT Reading Test contains 40 questions to be answered in 35 minutes.)

DIRECTIONS: The passage in this test is followed by several questions. After reading the passage, choose the best answer to each question and fill in the corresponding oval on your answer document. You may refer to the passage as often as necessary.

HUMANITIES: This passage is adapted from the article "Japan's Tansu: Cabinetry of the 18th and 19th Centuries" by Rosy Clarke (©1985 by W.R.C. Smith Publishing Company).

5 The Japanese, always pressed for room on their island empire, have long been masters at utilizing space. This is especially evident in the native handmade Japanese cabinetry known as *tansu*, produced from about 1750 to 1900. A prolific range of wooden *tansu* was created for a variety of needs, and a diverse group of pieces emerged, ranging from small, portable medicine chests to giant trunks on wheels.

10 Prior to Japan's Edo Period (1603-1867), ownership of furniture was limited to the nobility. Primarily, these were black-and-gold lacquered pieces of Chinese inspiration. But with the demise of Japan's feudal society and the rise of a moneyed merchant class by the mid-Edo Period, furniture in Japan took on its own personality, as craftsmen enjoyed the freedom to create original designs that combined function and beauty. Today, examples of these skillfully constructed chests tell us much about the lifestyle and accoutrements of people during the Edo Period and the Meiji Era (1868-1912).

25 The greatest demand was for clothing and merchants' chests; within these two categories, hundreds of stylistic variations occurred. Most clothing *tansu* were constructed with four long drawers for kimono storage and a small door compartment that opened to two or three tiny drawers for personal items. The chests were usually built in two pieces that stacked, a design that allowed for easy portability. A favorite wood used to build clothing *tansu* was paulownia, noted for its light weight and subtle, natural sheen. In the Edo Period, it was customary for Japanese fathers to plant a paulownia tree when a daughter was born. When she married, the tree was cut down and made into a trousseau chest.

35 Merchants' chests, used to store documents,

40 writing brushes, inkstones and money, were usually
constructed of thick zelkova or chestnut. Unlike
clothing tansu, which were kept inside a sliding door
closet in a home, a merchant's chest was in full view of
customers. Thus, shop tansu was an important indicator
of a shopkeeper's prosperity.

45 Some styles were surprisingly large, an example
being the staircase tansu. Japanese homes and shops
were often built with lofts, and for easy access from the
ground floor, a freestanding staircase was designed by
clever craftsmen who incorporated compartments and
drawers throughout for maximum utility. Around six
feet high, most staircase chests were made in two sec-
50 tions that stacked, though many one-piece chests were
also produced. Because of the great amount of wood
needed to build a staircase tansu, steps, risers and case
were made of softwood, and hardwood was used for
doors and drawer fronts.

55 Many households, especially rural homes, kept
large kitchen tansu to store food and crockery. The
wood of these practical kitchen chests was rarely fin-
ished, and those in original condition show a lovely
natural patina developed from years of exposure to the
smoke and heat of the cooking area. Kitchen tansu were
60 designed strictly for utility with sliding door compart-
ments, inner shelves and numerous small drawers. Like
staircase tansu, they display a minimum of ironwork
and rarely show locking drawers or doors.

65 After 1900, modern techniques replaced the
original handcrafted construction methods. Sand-cast
iron handles, for example, are common on furniture
made from about 1890 to 1920. Traditional designs--
dragons, cherry blossoms and mythical personalities--
70 that were once etched by hand onto lock plates became
simplified as machine-pressed patterns appeared. Thick
pieces of wood originally used became thinner around
1900, when improved wood planing techniques resulted
in mass-produced tansu of diminished quality. And the
75 amazing range of handproduced, naturally pigmented
lacquer finishes that hallmarked earlier tansu all but
disappeared by about 1920. With rapid industrialization
at hand, many of Japan's artisans abandoned their tradi-
tional crafts.

80 Appreciated today for their beauty, simplicity and
functionality, tansu are now showing up in homes in
America and Europe. But relatively few exceptional
examples of the thousands produced now remain. Those
pieces available document a special part of Japanese
85 history and culture as well as the remarkable sense of
space and design of Japan's unknown craftsmen.

1. The author states that the result of mass production techniques on the tansu was:

- A. diminished quality.
- B. thicker pieces of wood.
- C. renewed popularity.
- D. greater variety.

2. The passage states that although handmade tansu were designed and used for many purposes, most were:

- F. fancy black-and-gold finished pieces.
- G. kitchen cabinets.
- H. clothing and merchants' chests.
- J. staircase chests.

3. According to the passage, the original popularity of tansu resulted primarily from the:

- A. desire to display clothing and other personal items.
- B. need to make good use of space.
- C. need to disguise a merchant's wealth.
- D. desire to be different from the Chinese.

4. According to the passage, modern production methods caused which of the following changes in the tansu?

- I. Sand-cast iron handles
- II. Simplification of traditional designs
- III. Thinner wood

- F. II only
- G. III only
- H. I and II only
- J. I, II, and III

6. The author claims that by studying examples of handcrafted Japanese tansu that are still available today, scholars can learn about which of the following?

- I. How mass production first began in Japan
- II. How Japanese industrialists developed shortcuts in building furniture
- III. How the Japanese lived during the Edo Period and the Meiji Era

- E. II only
- G. III only
- H. I and II only
- J. I, II, and III

7. According to the account of tansu-making in the passage, improved wood-planing techniques resulted in:

- A. a need to change the types of wood used.
- B. the need to apply thicker wood finishes.
- C. the use of thinner wood.
- D. a renewed interest in black-and-gold lacquered finishes.

8. The passage suggests that the Japanese tansu had changed by the mid-Edo Period in which of the following ways?

- F. It reflected increased creative freedom of the craftsmen.
- G. It became a symbol of status and wealth for the nobility.
- H. It became less important to the merchant class.
- J. It became much larger.

As it is used in the passage, the word *patina* (line 58) most nearly means the:

5.

- A. design carved in the wood of the chests.
- B. original finish applied to the chest.
- C. destruction of the wood by smoke and heat.
- D. surface appearance of the wood.

9.

According to the passage, the Chinese influence on Japanese furniture-making is reflected in which of the following characteristics of some Japanese furniture?

- I. The use of space
- II. The black and gold lacquer
- III. The use of paulownia wood

- A. II only
- B. III only
- C. I and II only
- D. I, II, and III

10. The passage indicates about tansu that they were:

- I. used for aesthetic purposes only.
- II. indicative of financial status.
- III. hidden from view because they held important documents.

- E. I only
- G. II only
- H. I and II only
- J. II and III only



SCIENCE TEST QUESTIONS

Click on the letter choices to determine if you have the correct answer and for question explanations.

(An actual ACT Science Test contains 40 questions to be answered in 35 minutes.)

DIRECTIONS: The passage in this test is followed by several questions. After reading the passage, choose the best answer to each question and fill in the corresponding oval on your answer document. You may refer to the passage as often as necessary.

You are NOT permitted to use a calculator on this test.

Passage I

Measles is an extremely contagious viral infection spread by the respiratory route. Figure 1 shows the course of measles from time of exposure to recovery from the infection.

After recovery from measles, the infected individual develops immunity or resistance to reinfection. Figure 1 shows the development of immunity indicated by the antibody level.

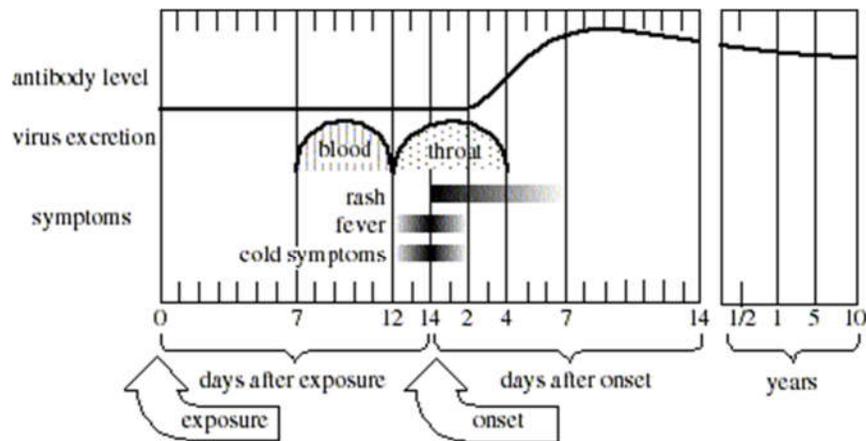


Figure 1

Figure 1 adapted from D. M. McLean, *Virology in Health Care*. ©1980 by Williams & Wilkins.

The number of reported cases of measles from 1950 through 1987 is depicted in Figure 2.

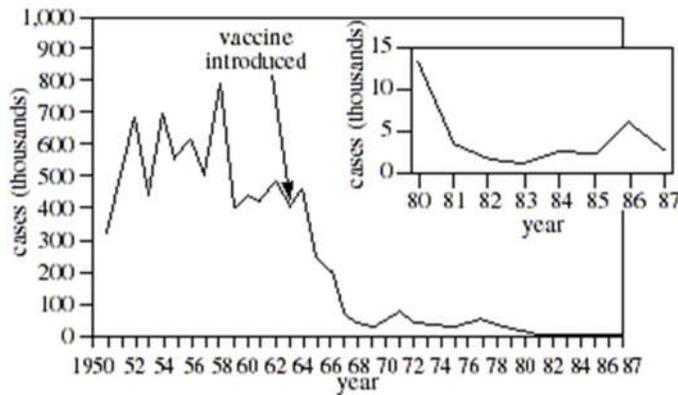


Figure 2

Figure 2 adapted from MMWR, "Summary of Notifiable Diseases." ©1986 Communicable Disease Center.

1. On Day 10 after exposure to measles, one could conclude that the greatest concentration of the measles virus would most likely be found in which of the following locations?
 - A. Skin
 - B. Mouth
 - C. Blood
 - D. Throat
2. The introduction of the measles vaccine had which of the following effects, if any, on the occurrence of measles?
 - F. It completely eradicated measles after 1963.
 - G. It caused a decrease in the number of measles cases only during 1963.
 - H. It caused a gradual decrease from 400,000 measles cases in 1963 to approximately 1,500 in 1983.
 - J. The introduction of the measles vaccine had no effect on the occurrence of measles after 1963.
3. Based on the information presented in the passage and in Figure 1, would it be possible to determine that a person had immunity against the measles virus 6 months after exposure?
 - A. Yes; the level of protective antibodies against measles would be elevated 6 months after exposure.
 - B. Yes; the virus would still be present in the respiratory tract to protect against reinfection.
 - C. No; the level of protective antibodies against measles would be undetectable 6 months after exposure.
 - D. No; the virus would no longer be present in the blood to protect against reinfection.
4. On the basis of Figure 1, one can conclude that there is a rise in the antibody level when the:
 - F. fever vanishes.
 - G. rash first appears.
 - H. cold symptoms are most severe.
 - J. virus is present in the blood.

5.

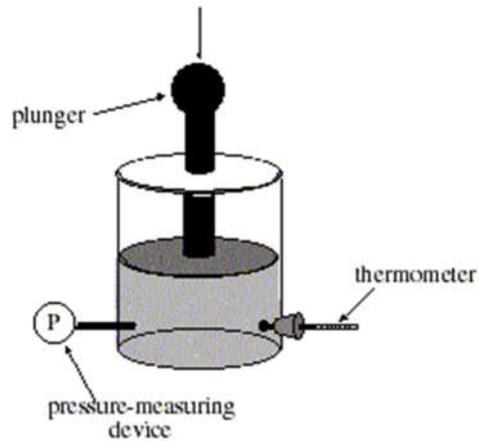
According to Figure 2, the highest number of measles cases between 1981 and 1987 was approximately:

- A. 10.
- B. 100.
- C. 1,000.
- D. 5,000.

Passage II

The relationship between pressure and volume of a gas was studied while the temperature was held constant. A container was filled with helium gas at room temperature and sealed (see figure below). The pressure on the gas could be controlled by varying the force exerted on the plunger, and the volume could be determined by the height of the plunger.

(Note: Assume that the mass of the plunger is insignificant.)



Experiment 1

The initial pressure in this experiment was 1 atmosphere (atm). At that pressure the gas occupied 1 liter (L). The pressure of the helium was increased very slowly, by decreasing the volume, so that the gas remained at room temperature. The heat generated was released into the surrounding atmosphere.

The pressure and the volume of the helium were recorded in Table 1.

Table 1	
Pressure (atm)	Volume (L)
1.0	1.00
1.5	0.67
2.0	0.50
2.5	0.40
3.0	0.33

Experiment 2

Experiment 1 was repeated at room temperature with an initial pressure of 1 atm and an initial volume of 2 L. The results are shown in Table 2.

Table 2	
Pressure (atm)	Volume (L)
1.0	2.00
1.5	1.33
2.0	1.00
2.5	0.80
3.0	0.67

Experiment 3

In this experiment the entire gas container was insulated to prevent heat loss. The procedures from Experiment 1 were repeated. It was observed that the temperature of the gas rose as the volume decreased. Table 3 shows the volume measured at each pressure during the compression.

Table 3	
Pressure (atm)	Volume (L)
1.0	1.00
1.5	0.78
2.0	0.66
2.5	0.58
3.0	0.52

The insulation was then removed and the pressure maintained at 3 atm. As the gas cooled to room temperature, the volume of the gas slowly decreased from 0.52 to 0.33 L.

6. How is the design of Experiment 1 different from that of Experiment 2 ?
- F. The container is insulated in Experiment 2, but not in Experiment 1.
 - G. A different gas is used in Experiment 2 than in Experiment 1.
 - H. The initial volume of the gas in Experiment 1 is half that of Experiment 2.
 - J. The initial volume of the gas in Experiment 1 is twice that of Experiment 2.
7. A seventeenth-century scientist named Robert Boyle discovered that as the pressure on any confined gas increases (with the temperature held constant), the volume decreases. The best way to verify these results would be to repeat Experiment 1 with:
- A. an identical container made of a different material than the original.
 - B. an identical volume of water.
 - C. several different gases.
 - D. an unsealed container.
8. If Experiment 1 is continued and the pressure is increased to 4 atm and remains fixed at this pressure, the gas would occupy a volume of approximately:
- F. 0.25 L.
 - G. 0.33 L.
 - H. 0.50 L.
 - J. 1.00 L.
9. If Experiment 1 had started with 0.5 L of gas at 1 atm, what volume would be recorded when the pressure was 2.5 atm?
- A. 0.20 L
 - B. 0.30 L
 - C. 0.40 L
 - D. 0.44 L
10. Which of the following statements best explains why the temperature of the container decreased after the insulation was removed in Experiment 3 ?
- F. The pressure increased, causing the temperature to decrease.
 - G. The volume decreased, causing the temperature to decrease.
 - H. Heat flowed from the surrounding atmosphere, through the container, and into the gas.
 - J. Heat flowed from the gas, through the container, and into the surrounding atmosphere.
11. Suppose that Experiment 3 was modified so that the insulation was removed after each pressure increase and the container was allowed to sit at that pressure until its temperature cooled to room temperature. How would the volume readings be influenced, if at all, by this modified procedure?
- A. They would be the same as those in Experiment 1.
 - B. They would be the same as those in Experiment 3.
 - C. They would be greater than those in Experiment 2.
 - D. They would be smaller than those in Experiment 1.