

ACT Pre-TEST: 9th Graders

Since there are 10 questions you get 10 minutes. Do your best! Place the CAPITAL LETTER in the box provided.



MATHEMATICS TEST

60 Minutes — 60 Questions

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. A pattern exists among the units digits of the powers of 7. What is the units digit of 7^{50} ? (Note: The units digit of 2,401 is 1.)

- A. 1
B. 3
C. 4
D. 7
E. 9

E

$$\frac{50}{4} = 12.5$$

$$12 \overline{) 93} \begin{array}{r} 7 \\ \underline{84} \\ 93 \end{array}$$

$$7^7 = 823543$$

$$7^8 = 5764801$$

$$7^1 = 7$$

$$7^2 = 49$$

$$7^3 = 343$$

$$7^4 = 2401$$

$$7^5 = 16807$$

$$7^6 = 117649$$

2. The strength of the tower's signal to Esteban's house depends on the straight-line distance between his house and the tower. What is the straight-line distance, in miles, between Esteban's house and the tower?

- F. $\sqrt{11}$
G. $\sqrt{17}$
H. $\sqrt{29}$
J. $\sqrt{41}$
K. $\sqrt{61}$

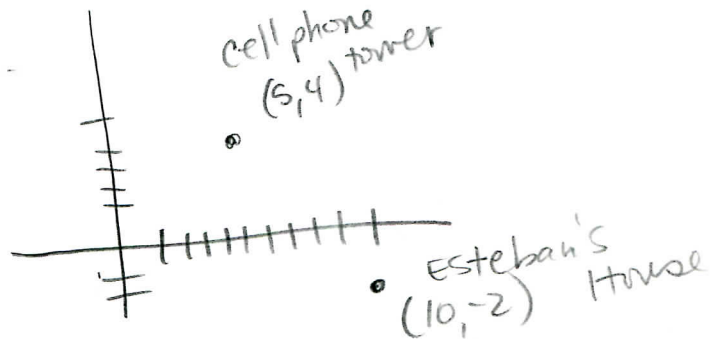
K

$$\sqrt{(5-10)^2 + (4+2)^2}$$

$$\sqrt{(-5)^2 + (6)^2}$$

$$\sqrt{25 + 36}$$

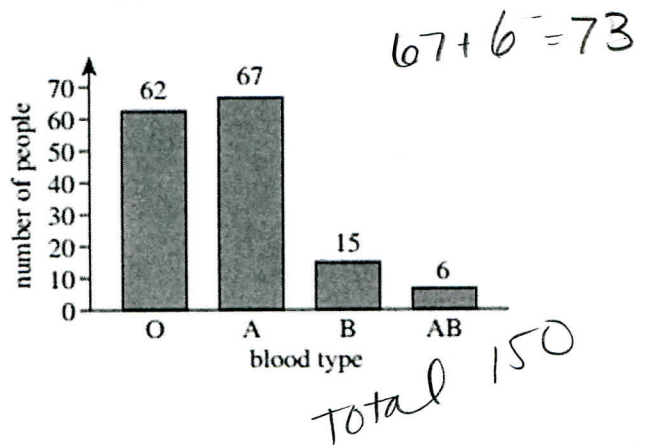
$$\sqrt{61}$$



3. The blood types of 150 people were determined for a study as shown in the figure below. If a person from this study is randomly selected, what is the probability that this person has either Type A or Type AB blood?

- A. $\frac{62}{150}$
 B. $\frac{66}{150}$
 C. $\frac{68}{150}$
 D. $\frac{73}{150}$
 E. $\frac{84}{150}$

$$\frac{73}{150}$$



4. The monthly fees for single rooms at 5 colleges are \$370, \$310, \$380, \$340, and \$310, respectively. What is the mean of these monthly fees?

- F. \$310
 G. \$340
 H. \$342
 J. \$350
 K. \$380

$$\frac{370 + 310 + 380 + 340 + 310}{5}$$

$$\frac{1710}{5} = 342$$

5. On a particular road map, $\frac{1}{2}$ inch represents 18 miles. About how many miles apart are 2 towns that are $2\frac{1}{2}$ inches apart on this map?

- A. 18
 B. $22\frac{1}{2}$
 C. 36
 D. 45
 E. 90

$$\frac{\frac{1}{2}}{18} = \frac{2\frac{1}{2}}{x}$$

$$\frac{9(\frac{5}{2})}{18(\frac{5}{2})}$$

$$\frac{1}{2}x = 45$$

$$x = 90$$

6. Given $f = cd^3$, $f = 450$, and $d = 10$, what is c ?

- F. 0.45
 G. 4.5
 H. 15
 J. 45
 K. 150

$$450 = c(10)^3$$

$$\frac{450}{1000} = \frac{c(1000)}{1000}$$

$$c = 0.45$$

7. If $f(x) = (3x + 7)^2$, then $f(1) = ?$

- A. 10
- B. 16
- C. 58
- D. 79
- E. 100**

$$f(1) = (3(1) + 7)^2$$

$$= (3 + 7)^2$$

$$= (10)^2$$

$$= 100$$

8. The shipping rate for customers of Ship Quick consists of a fee per box and a price per pound for each box. The table below gives the fee and the price per pound for customers shipping boxes of various weights.

Gregg wants Ship Quick to ship 1 box that weighs 15 pounds. What is the shipping rate for this box?

- F. \$9.75
- G. \$16.50
- H. \$19.75**
- J. \$20.00
- K. \$24.50

Weight of box (pounds)	Fee	Price per pound
Less than 10	\$ 5.00	\$1.00
10-25	\$10.00	\$0.65
More than 25	\$20.00	\$0.30



$$y = 10 + .65(15) = 19.75$$

9. The table below shows the number of cars Jing sold each month last year. What is the median of the data in the table?

- A. 13
- B. 16
- C. 19
- D. 20.5
- E. 23.5**

$$\frac{22 + 25}{2} = 23.5$$

13 15 16 19 19 22
 25 25 26 27 28 29

Month	Number of cars sold
January	25
February	15
March	22
April	19
May	16
June	13
July	19
August	25
September	26
October	27
November	28
December	29

middle in order

10. In which of the following are $\frac{1}{2}$, $\frac{5}{6}$, and $\frac{5}{8}$ arranged in ascending order?

- F. $\frac{1}{2} < \frac{5}{8} < \frac{5}{6}$**
- G. $\frac{5}{6} < \frac{1}{2} < \frac{5}{8}$
- H. $\frac{5}{6} < \frac{5}{8} < \frac{1}{2}$
- J. $\frac{5}{8} < \frac{1}{2} < \frac{5}{6}$
- K. $\frac{5}{8} < \frac{5}{6} < \frac{1}{2}$

$$\frac{1}{2} = .5$$

$$\frac{5}{6} = .83$$

$$\frac{5}{8} = .625$$

growing increasing

$$.5 \quad .625 \quad .83$$

$$\frac{1}{2} < \frac{5}{8} < \frac{5}{6}$$