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.
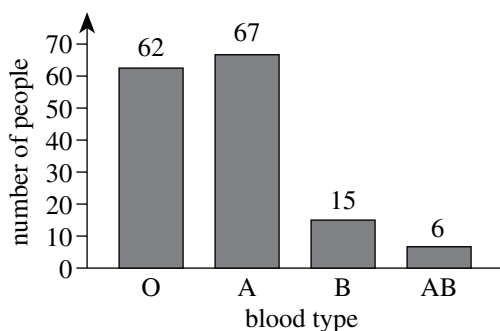
You are permitted to use a calculator on this test. You may use your calculator for any problems you choose,

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.

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1. The blood types of 150 people were determined for a study as shown in the figure below.

If 1 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. $\frac{84}{150}$

2. 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

3. 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

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

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

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

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

6. Jorge's current hourly wage for working at Denti Smiles is $12.00. Jorge was told that at the beginning of next month, his new hourly wage will be an increase of 6% of his current hourly wage. What will be Jorge's new hourly wage?

F. $12.06
G. $12.60
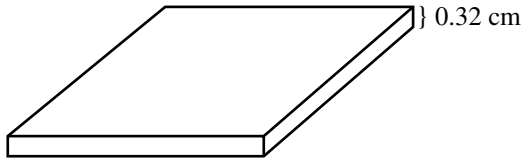**H.** $12.72
J. $18.00
K. $19.20

7. The first term is 1 in the geometric sequence 1, −3, 9, −27, ⋯. What is the SEVENTH term of the geometric sequence?

  A. −243
  B. −30
  C.   81
  D. 189
  E. 729

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.

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

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

9. A computer chip 0.32 cm thick is made up of layers of silicon. If the top and bottom layers are each 0.03 cm thick and the inner layers are each 0.02 cm thick, how many inner layers are there?

} 0.32 cm

  A. 13
  B. 15
  C. 16
  D. 52
  E. 64

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

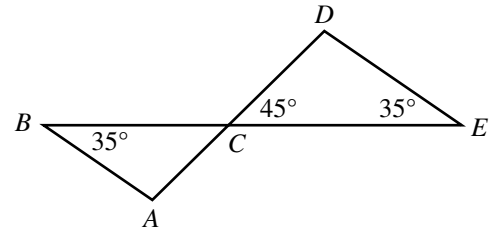| Month	Number of cars sold
January	25
February	15
March	22
April	19
May	16
June	13
July	19
August	25
September	26
October	27
November	28
December	29

  F. 13
  G. 16
  H. 19
  J. 20.5
  K. 23.5

11. Students studying motion observed a cart rolling at a constant rate along a straight line. The table below gives the distance, d feet, the cart was from a reference point at 1-second intervals from $t = 0$ seconds to $t = 5$ seconds.
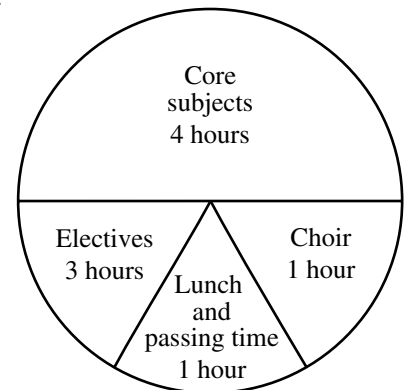
t	0	1	2	3	4	5
d	14	20	26	32	38	44

Which of the following equations represents this relationship between d and t ?

  A. $d =\ \ \ t + 14$
  B. $d =\ \ 6t +\ \ 8$
  C. $d =\ \ 6t + 14$
  D. $d = 14t +\ \ 6$
  E. $d = 34t$

12. The length of a rectangle with area 54 square centimeters is 9 centimeters. What is the perimeter of the rectangle, in centimeters?

  F.   6
  G. 12
  H. 15
  J. 24
  K. 30

13. In the figure below, C is the intersection of $\overline{AD}$ and $\overline{BE}$. If it can be determined, what is the measure of $\angle BAC$?

  A.   80°
  B. 100°
  C. 110°
  D. 115°
  E. Cannot be determined from the given information

14. Antwan drew the circle graph below describing his time spent at school in 1 day. His teacher said that the numbers of hours listed were correct, but that the central angle measures for the sectors were not correct. What should be the central angle measure for the Core subjects sector?

  F.   72°
  G.   80°
  H. 160°
  J. 200°
  K. 288°

GO ON TO THE NEXT PAGE.