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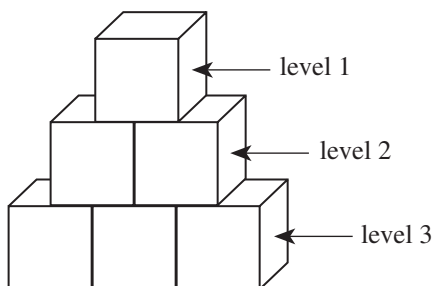
You are permitted to use a calculator on this test. You may use your calculator for any problems you choose,

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. Carmen is playing with blocks. She arranges stacks of blocks so that each successive level of blocks has 1 fewer block than the level below it and the top level has 1 block. Such a stack with 3 levels is shown below. Carmen wants to make such a stack with 12 levels. How many blocks would she use to build this stack?

- level 1
- level 2
- level 3

- **A.** 66
- **B.** 78
- **C.** 132
- **D.** 144
- **E.** 156

2. To keep up with rising expenses, a motel manager needs to raise the $40.00 room rate by 22%. What will be the new rate?

- **F.** $40.22
- **G.** $42.20
- **H.** $48.00
- **J.** $48.80
- **K.** $62.00

3. As a salesperson, your commission is directly proportional to the dollar amount of sales you make. If your sales are $800, your commission is $112. How much commission would you earn if you had $1,400 in sales?

- **A.** $210
- **B.** $196
- **C.** $175
- **D.** $128
- **E.** $ 64

4. If $7 + 3x = 22$, then $2x = ?$

- **F.** 5
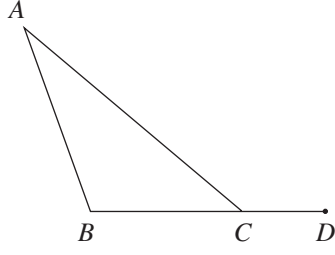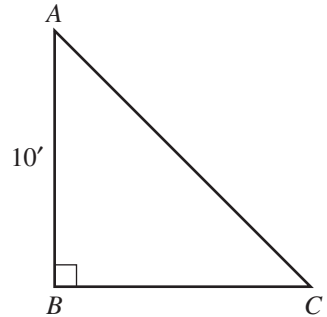- **G.** 10
- **H.** 12
- **J.** 14
- **K.** $\frac{58}{3}$

5. The total cost of renting a car is $30.00 for each day the car is rented plus $28\frac{1}{2}$¢ for each mile the car is driven. What is the total cost of renting the car for 5 days and driving 350 miles?

(Note: No sales tax is involved.)

- **A.** $ 104.75
- **B.** $ 159.98
- **C.** $ 249.75
- **D.** $ 300.00
- **E.** $1,147.50

6. In any parallelogram *ABCD*, it is always true that the measures of ∠*ABC* and ∠*BCD*:

- **F.** add up to 180°.
- **G.** add up to 90°.
- **H.** are each greater than 90°.
- **J.** are each 90°.
- **K.** are each less than 90°.

7. What is the least common denominator for adding the fractions $\frac{4}{15}$, $\frac{1}{12}$, and $\frac{3}{8}$?

A. 40
B. 120
C. 180
D. 480
E. 1,440

8. The product $(2x^4y)(3x^5y^8)$ is equivalent to:

F. $5x^9y^9$
G. $6x^9y^8$
H. $6x^9y^9$
J. $5x^{20}y^8$
K. $6x^{20}y^8$

9. It costs a dollars for an adult ticket to a reggae concert and s dollars for a student ticket. The difference between the cost of 12 adult tickets and 18 student tickets is $36. Which of the following equations represents this relationship between a and s ?

A. $\frac{12a}{18s} = 36$

B. $216as = 36$

C. $|12a - 18s| = 36$

D. $|12a + 18s| = 36$

E. $|18a + 12s| = 36$

10. If $x > 1$, then which of the following has the LEAST value?

F. $\sqrt{x}$
G. $\sqrt{2x}$
H. $\sqrt{x \cdot x}$
J. $x\sqrt{x}$
K. $x \cdot x$

11. Charles defined a new operation, ♦, on pairs of ordered pairs of integers as follows: $(a,b) \; ♦ \; (c,d) = \frac{ac + bd}{ab - cd}$. What is the value of $(2,1) \; ♦ \; (3,4)$?

A. −2
B. −1
C. 2
D. 5
E. 10

12. In the figure below, $\angle BAC$ measures 30°, $\angle ABC$ measures 110°, and points B, C, and D are collinear. What is the measure of $\angle ACD$?

F. 150°
G. 140°
H. 130°
J. 120°
K. 110°

13. In the isosceles right triangle below, $AB = 10$ feet. What is the length, in feet, of $\overline{AC}$?

A. 5
B. 10
C. 20
D. $\sqrt{20}$
E. $10\sqrt{2}$

14. In a bag of 400 jelly beans, 25% of the jelly beans are red in color. If you randomly pick a jelly bean from the bag, what is the probability that the jelly bean picked is NOT one of the red jelly beans?

F. $\frac{1}{2}$

G. $\frac{1}{4}$

H. $\frac{3}{4}$

J. $\frac{1}{16}$

K. $\frac{15}{16}$