**SECTION 2**
Time – 25 minutes
20 Questions

Turn to Section 5 of your answer sheet to answer the questions in this section.

Directions: For this section, solve each problem and decide which is the best of the choices given. Fill in the corresponding circle on the answer sheet. You may use any available space for scratch work.

Notes

1. The use of calculator is permitted.
2. All numbers used are real numbers.
3. Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possibly EXCEPT when it is stated in a specific problem that the figure is not drawn to scale. All figures lie in a plane unless otherwise indicated.
4. Unless otherwise specified, the domain of any function f is assumed to be the set of all real numbers x for which $f(x)$ is a real number.
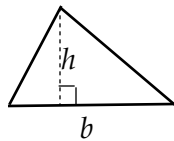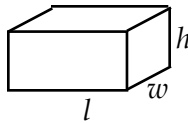
Reference Information
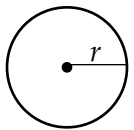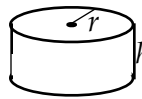

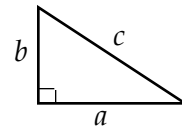$A = \pi \cdot r^2$
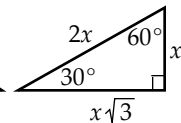$C = 2 \cdot \pi \cdot r$
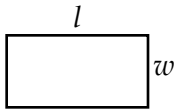
$A = l \cdot w$
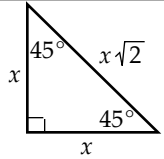
$A = \frac{1}{2} b \cdot h$

$V = l \cdot w \cdot h$

$V = \pi \cdot r^2 \cdot h$

$c^2 = a^2 + b^2$

Special Right Triangles

The number of degrees of arc in a circle is 360.
The sum of the measures in degrees of the angles of a triangle is 180.

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1. Jack has 7 blue marbles, 1 red marble, 9 green marbles, and 7 purple marbles in a bag. If Jack randomly selects a marble from his bag, what is the probability the marble will NOT be a blue or red marble?

(A) $\dfrac{1}{4}$

(B) $\dfrac{1}{3}$

(C) $\dfrac{5}{12}$

(D) $\dfrac{1}{2}$

(E) $\dfrac{2}{3}$

2. Dan went to the store with a $20 bill. He buys 5 cans of beans and 3 cans of corn. If each can of beans costs $2 and each can of corn cost $1.50, how much change did Dan receive after paying for his food with his $20 bill?

(A) $4.00
(B) $4.50
(C) $5.00
(D) $5.50
(E) $6.00

GO ON THE THE NEXT PAGE
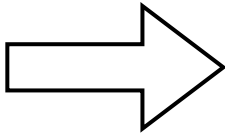
3. If the figure above is rotated 135° counter-clockwise, which of the following represents the resulting figure?

(A)

(B)

(C)

(D)

(E)
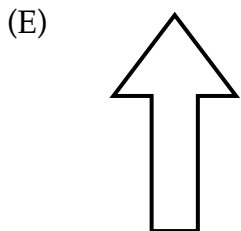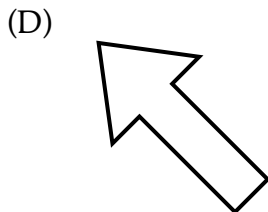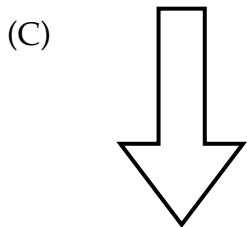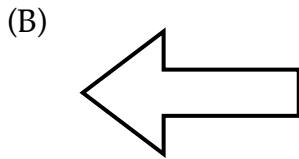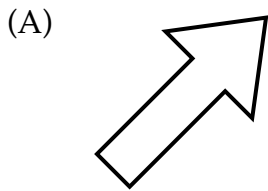
4. What is the equivalent equation to the following statement:

"Fourteen less than two times x is equal to fourteen more than one-half of y"

(A) $\frac{1}{2}x + 14 = 2y - 14$

(B) $2x - 14 = \frac{1}{2}y + 14$

(C) $2x = 2m + 28$

(D) $2x + 14 = \frac{1}{2}y - 14$

(E) $\frac{1}{2}x = 2y - 28$

5. Four friends, Abby, Brandon, Caleb, and Dan, are all sitting together on a bench. If Caleb is not sitting next to Brandon, and Brandon is not at the end, which of the following can be true?

   I. Caleb is sitting at the end.
   II. Abby is sitting next to Caleb.
   III. Dan is sitting between Brandon and Caleb.

(A) I only
(B) II only
(C) III only
(D) II and III only
(E) I, II, and III

6. A list of numbers contains 7 consecutive integers arranged in increasing order. If the arithmetic mean (average) of this list is 20, what number is the second number of this list?

(A) 13
(B) 14
(C) 17
(D) 18
(E) 19

7. The population of a small town was 1,250 in 2001. In 2003, the population was 2,500 and in 2005 the population was 5,000. If the population of this small town continued to grow at the same rate, what was its population in 2009?

(A) 10,000
(B) 15,000
(C) 20,000
(D) 40,000
(E) 80,000

8. A circle with area 9π goes through the origin at point (0,0). Which of the following points could NOT lie in the interior of this circle?

(A) (2,4)
(B) (-4,-4)
(C) (5,-3)
(D) (0,-5)
(E) (6,-1)

9. If $5a = 3b$ and $3b = 15$, then $2(9b - 10a) =$

(A) 16
(B) 20
(C) 24
(D) 30
(E) 46

10. What is the distance of a segment with endpoints at (-2,-4) and (7,8) ?

(A) $\sqrt{41} \approx 6.03$
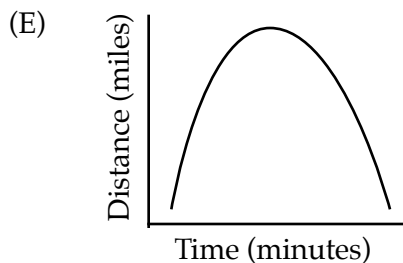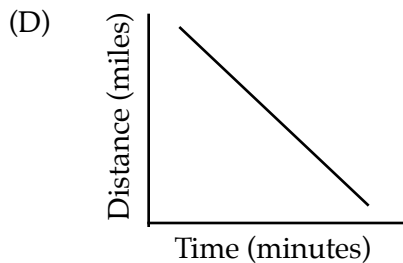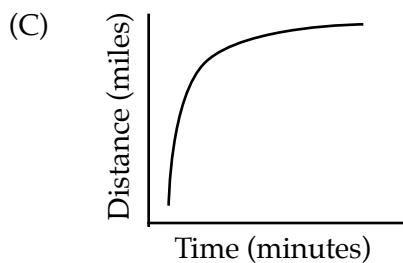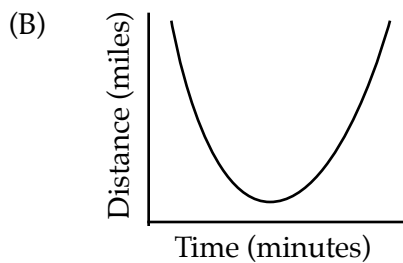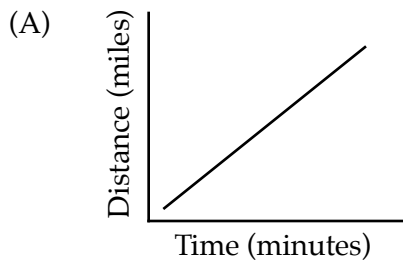(B) 13
(C) $\sqrt{97} \approx 9.85$
(D) 15
(E) 21

11. If the line containing the points (6,a) and (3,3) has a slope of $\dfrac{4}{3}$, then $a =$

(A) 3
(B) 5
(C) 6
(D) 7
(E) 9

Time (in minutes)	Distance (in miles)
1	200
2	100
3	50
4	100
5	200

12. What graph best represents the information indicated in the table?

(A)

(B)

(C)

(D)

(E)

13. If x and y are positive integers and $18 < xy < 22$, all of the following could be values of x EXCEPT

(A) 3
(B) 4
(C) 6
(D) 7
(E) 10

14. Points M and N lie on the circle with center O (not shown) such that the measure of $\overarc{MN}$ is 90°. If P is a point somewhere on the circle such that the length of $\overarc{MP}$ is two times the length of $\overarc{NP}$, then the length of $\overarc{NP}$ could be equal to?

(A) 20°
(B) 45°
(C) 90°
(D) 135°
(E) 180°

15. Let $x > 1$, if $\dfrac{\sqrt{x}}{x^{b}} = x^{\frac{3}{4}}$, what is the value for b ?

(A) $\dfrac{1}{4}$

(B) $\dfrac{1}{3}$

(C) $\dfrac{1}{2}$

(D) 1

(E) 4

16. If x and y are positive integers and $2x + 3y = 24$, what is the sum of the greatest and least possible value of y ?

(A) 8
(B) 10
(C) 11
(D) 14
(E) 16

17. The average (arithmetic mean) height of a 6 people is 58 inches. If 4 more people are added to the group, the average height becomes 64 inches. What is the average height of the 4 new people?

(A) 68
(B) 69
(C) 70
(D) 73
(E) 75

18. On a certain clock, the hour hand is 75% as long as the minute hand. If point A is at the tip of the minute hand, and point B is at the tip of the hour hand, what is the ratio of the distance that point A travels in 2 hours to the distance that point B travels in 24 hours ?

(A) 1:3
(B) 1:4
(C) 3:4
(D) 4:3
(E) 8:3

19. In a bag, the ratio from red marbles to blue marbles is r to b. Five blue marbles are added to the bag. If the ratio of red marbles to blue marbles is to remain unchanged, how many red marbles must be added to the bag ?

(A)   5

(B) $\dfrac{r}{b}$

(C) $\dfrac{5r}{b}$

(D) $2r^2 - 5b$

(E) $\dfrac{r}{(r + 5)}$

20. Set A consists of all multiples of 2 less than 12. Set B consists of all the positive even factors of 12. Which of the following represents the intersection of set A and set B ?

(A) {1, 2, 3, 4, 6, 8, 10, 12}
(B) {2, 4, 6, 8, 10, 12}
(C) {2, 4, 6, 8, 10}
(D) {2, 4, 6, 8}
(E) {2, 4, 6}

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