



SECTION 9

Time — 20 minutes

16 Questions

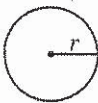
Turn to Section 9 (page 7) of your answer sheet to answer the questions in this section.

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 scratchwork.

Notes

- The use of a calculator is permitted.
- All numbers used are real numbers.
- Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible 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.
- 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

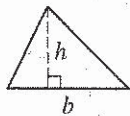


$$A = \pi r^2$$

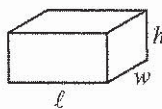
$$C = 2\pi r$$



$$A = \ell w$$



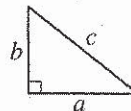
$$A = \frac{1}{2}bh$$



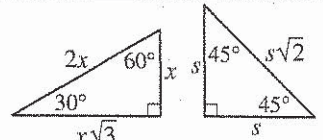
$$V = \ell wh$$



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



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



Special Right Triangles

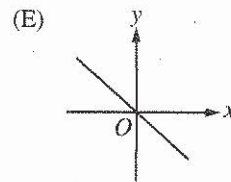
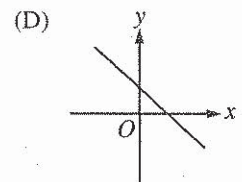
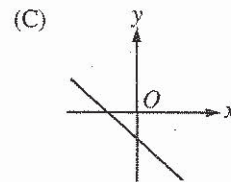
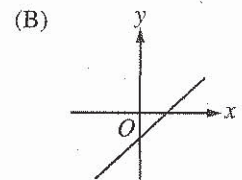
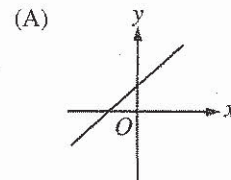
The number of degrees of arc in a circle is 360.

The sum of the measures in degrees of the angles of a triangle is 180.

1. There is the same number of boys and girls on a school bus when it departs from school. At the first stop, 4 boys get off the bus and nobody gets on. After the first stop, there are twice as many girls as boys on the bus. How many girls are on the bus?

- (A) 4
(B) 6
(C) 8
(D) 12
(E) 16

2. Which of the following is the graph of a linear function with a negative slope and a positive y -intercept?



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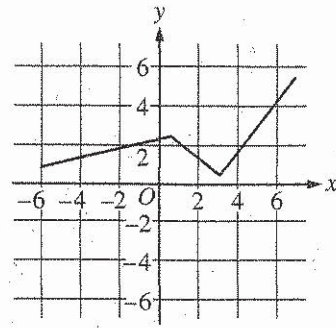


Questions 3-4 refer to the following price list.

| Number of Donuts | Total Price |
|------------------|-------------|
| 1 | \$0.40 |
| Box of 6 | \$1.89 |
| Box of 12 | \$3.59 |

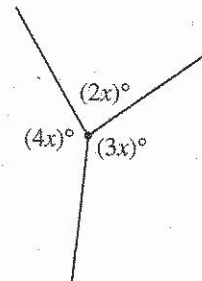
3. Of the following, which is the closest approximation of the cost per donut when one purchases a box of 6?
- (A) \$0.20
(B) \$0.30
(C) \$0.40
(D) \$0.50
(E) \$0.60

4. What would be the least amount of money needed to purchase exactly 21 donuts?
- (A) \$5.88
(B) \$6.68
(C) \$7.19
(D) \$7.38
(E) \$8.40



5. The figure above shows the graph of the function h . Which of the following is closest to $h(5)$?

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



Note: Figure not drawn to scale.

6. In the figure above, three line segments meet at a point to form three angles. What is the value of x ?
- (A) 20
(B) 36
(C) 40
(D) 45
(E) 60

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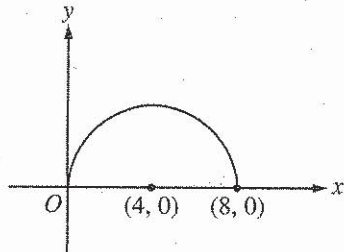


7. Positive integers x , y , and z satisfy the equations

$$x^{-\frac{1}{2}} = \frac{1}{3} \text{ and } y^z = 16. \text{ If } z > y, \text{ what is the value}$$

of $x + z$?

- (A) 5
(B) 7
(C) 11
(D) 13
(E) 15



8. In the semicircle above, the center is at $(4, 0)$. Which of the following are x -coordinates of two points on this semicircle whose y -coordinates are equal?

- (A) 1 and 6
(B) 1 and 8
(C) 2 and 6
(D) 2 and 8
(E) 3 and 6

9. If p is an integer and 3 is the remainder when $2p + 7$ is divided by 5, then p could be

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

10. Stacy noted that she is both the 12th tallest and the 12th shortest student in her class. If everyone in the class is of a different height, how many students are in the class?

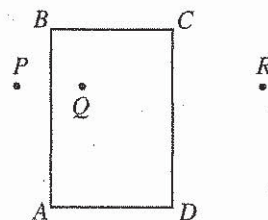
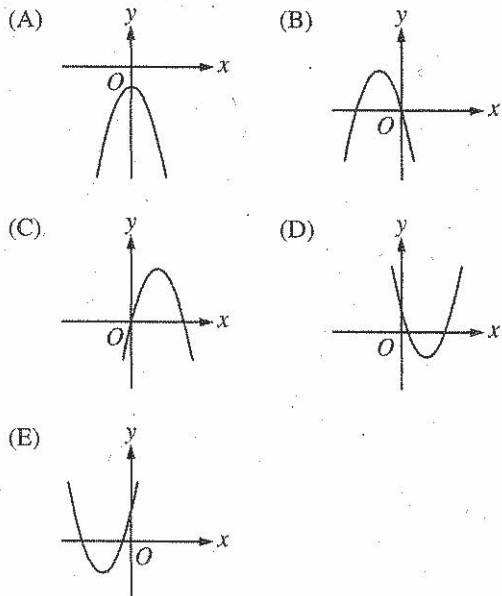
- (A) 22
(B) 23
(C) 24
(D) 25
(E) 34

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11. The quadratic function g is given by

$g(x) = ax^2 + bx + c$, where a and c are negative constants. Which of the following could be the graph of g ?



Note: Figure not drawn to scale.

12. In the figure above, $ABCD$ is a rectangle with $BC = 4$ and $AB = 6$. Points P , Q , and R are different points on a line (not shown) that is parallel to \overline{AD} . Points P and Q are symmetric about line AB and points Q and R are symmetric about line CD . What is the length of \overline{PR} ?
- (A) 6
 (B) 8
 (C) 10
 (D) 12
 (E) 20

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13. The price of a telephone was first increased by 10 percent and then the new price was decreased by 25 percent. The final price was what percent of the initial price?
- (A) 78%
(B) 80%
(C) 82.5%
(D) 85%
(E) 87.5%
-
14. When the number w is multiplied by 4, the result is the same as when 4 is added to w . What is the value of $3w$?
- (A) $\frac{3}{4}$
(B) 1
(C) $\frac{4}{3}$
(D) 3
(E) 4
15. The lengths of the sides of a right triangle are consecutive even integers, and the length of the shortest side is x . Which of the following equations could be used to find x ?
- (A) $x + x + 1 = x + 2$
(B) $x^2 + (x + 1)^2 = (x + 2)^2$
(C) $x^2 + (x + 2)^2 = (x + 4)^2$
(D) $x + x + 2 = x + 4$
(E) $x^2 = (x + 2)(x + 4)$
-
16. If x is an integer greater than 1 and if $y = x + \frac{1}{x}$, which of the following must be true?
- I. $y \neq x$
II. y is an integer.
III. $xy > x^2$
- (A) I only
(B) III only
(C) I and II only
(D) I and III only
(E) I, II, and III

STOP

If you finish before time is called, you may check your work on this section only.
Do not turn to any other section in the test.