



SECTION 2

Time — 25 minutes

20 Questions

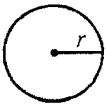
(1-20)

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

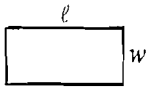
- The use of a calculator is permitted.
- All numbers used are real numbers.
- Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that the figure is not 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

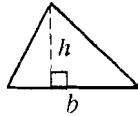


$$A = \pi r^2$$

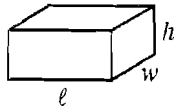
$$C = 2\pi r$$



$$A = \ell w$$



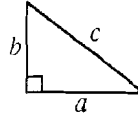
$$A = \frac{1}{2}bh$$



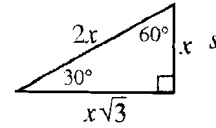
$$V = \ell wh$$



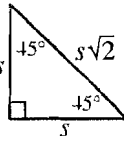
$$V = \pi r^2 h$$



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



Special Right Triangles

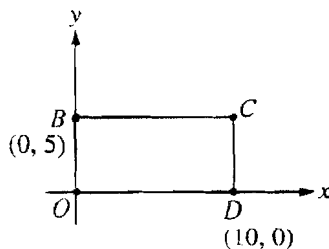


The number of degrees of arc in a circle is 360.

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

1. If $2\left(\frac{a}{k}\right) + 1 = 9$, what does $\frac{a}{k}$ equal?

- (A) 4
(B) 5
(C) 6
(D) 7
(E) 8



2. In the figure above, $OBCD$ is a rectangle. What are the coordinates of point C ?

- (A) (0, 10)
(B) (5, 0)
(C) (5, 5)
(D) (5, 10)
(E) (10, 5)

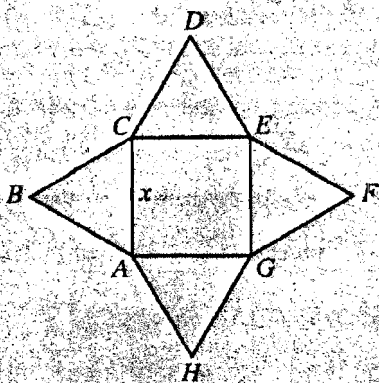
3. A painter has 4 unlabeled cans of paint. The colors of the paint are red, green, blue, and white. If the painter chooses one can of paint at random, what is the probability that the can does not contain green paint?

- (A) $\frac{1}{4}$
(B) $\frac{1}{3}$
(C) $\frac{1}{2}$
(D) $\frac{2}{3}$
(E) $\frac{3}{4}$



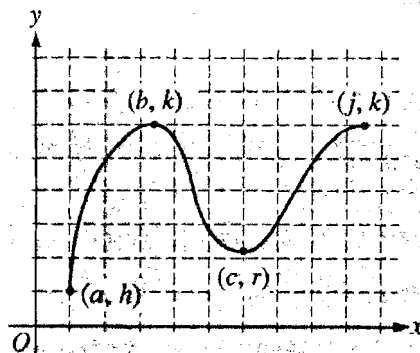
4. If $49 = (7y)^2$, then y could equal which of the following?

- I. -1
 - II. 1
 - III. 7
- (A) II only
 (B) III only
 (C) I and II
 (D) I and III
 (E) II and III



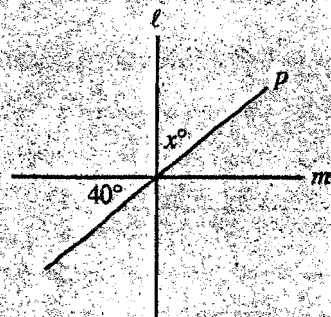
5. In the figure above, $ACEG$ is a square and triangles ABC , CDE , EFG , and GHA are all equilateral. If $AC = x$, what is the sum of the lengths of all the segments in the figure in terms of x ?

- (A) $8x$
 (B) $12x$
 (C) $16x$
 (D) $3x^2$
 (E) $5x^2$



6. The graph of the function f is given in the xy -plane above. Which of the following is true?

- (A) $f(a) = f(b)$
 (B) $f(a) = f(c)$
 (C) $f(b) = f(c)$
 (D) $f(b) = f(j)$
 (E) $f(c) = f(j)$



7. In the figure above, $l \perp m$. What is the value of x ?

- (A) 20
 (B) 30
 (C) 40
 (D) 50
 (E) 60

8. For all values of x , y , and w , the expression $wx + yw - 2w$ is equal to

- (A) $w(x + y) - 2$
 (B) $2(x + y) - 2w$
 (C) $w(y - 2 + x)$
 (D) $y(x + w) - 2$
 (E) $2w - w(x + x)$



$$f(x) = \frac{1}{\sqrt{x+2}}$$

9. Based on the definition of the function f above, for which of the following values of x is f NOT defined?

(A) -2
 (B) -1
 (C) 0
 (D) 1
 (E) 2

Apples	Price per Apple
Red apples	\$0.25
Green apples	\$0.35

10. The table above shows the prices of two kinds of apples. Ms. Jones bought twice as many red apples as green apples. If she spent \$7.65 on these apples, how many green apples did she buy?

(A) 9
 (B) 13
 (C) 18
 (D) 22
 (E) 27

$x, y, 10, z, 18, \dots$

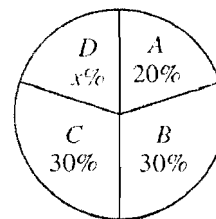
11. In the sequence above, the same positive integer is added to each term, starting with x , to obtain the next term in the sequence. What is the sum of the first five terms of the sequence?

(A) 44
 (B) 46
 (C) 48
 (D) 50
 (E) 52

12. In the xy -plane, $(3, 2)$ and $(13, 2)$ are the coordinates of two points on a circle. If the center of the circle has coordinates $(a, 2)$, what is the value of a ?

(A) 5
 (B) 8
 (C) 10
 (D) 16
 (E) 18

FABRIC DISTRIBUTION



13. The graph above shows the percent of fabric distributed each year to retailers A , B , C , and D by a manufacturer. In 2000 the manufacturer distributed a total of 1,500,000 yards of fabric to these retailers, and in 2005 the manufacturer distributed a total of 2,800,000 yards of fabric to these retailers. What was the increase in the number of yards of fabric distributed to retailer D from 2000 to 2005?

(A) 20,000
 (B) 26,000
 (C) 39,000
 (D) 260,000
 (E) 390,000

14. If a and b are integers and $\frac{14}{3} = \frac{a}{b}$, which of the following could be the value of $a + b$?

(A) 68
 (B) 66
 (C) 63
 (D) 60
 (E) 58

15. In a tournament, each of the 6 participants played 2 matches against each of the other participants. What was the total number of matches played during the tournament?

(A) 12
 (B) 15
 (C) 30
 (D) 36
 (E) 48



16. If $-1 < x < 0$, which of the following has the least value?

(A) $-x$

(B) $\frac{1}{x}$

(C) $-\frac{1}{x}$

(D) $\frac{1}{x^2}$

(E) $\frac{1}{x^3}$

17. The perimeter of right triangle RST is equal to the perimeter of isosceles triangle XYZ . The lengths of the legs of the right triangle are 6 and 8. If the length of each side of the isosceles triangle is an integer, what is the greatest possible length for one of the sides of isosceles triangle XYZ ?

(A) 10

(B) 11

(C) 14

(D) 16

(E) 22

18. If $x < y < 0$, which of the following must be true?

I. $x+1 < y+2$

II. $3x < 2y$

III. $\frac{x}{y} > 1$

(A) I only

(B) II only

(C) III only

(D) I and II only

(E) I, II, and III

19. At a company, there are n more male employees than female employees. If there are k male employees at the company, what fraction of the employees are male, in terms of n and k ?

(A) $\frac{1}{2k+n}$

(B) $\frac{k}{k+n}$

(C) $\frac{k}{2k-n}$

(D) $\frac{n}{2k+n}$

(E) $\frac{k-n}{2k}$



20. The right circular cylinder shown above has radius r and height h . Not including its bases, the surface area of the cylinder is $2\pi rh$. If this surface area not including the bases is 70π , what is the volume of the cylinder in terms of r ?

(A) $35\pi r$

(B) $70\pi r$

(C) $\frac{1}{2}\pi r^2$

(D) $35\pi r^2$

(E) $70\pi r^2$

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.