



SECTION 4

Time — 25 minutes

20 Questions

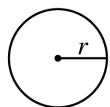
Turn to Section 4 (page 5) of your answer sheet to answer the questions in this section.

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 scratchwork.

Notes

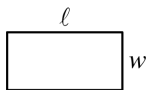
1. The use of a calculator is permitted.
2. All numbers used are real numbers.
3. Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that the figure is not drawn to scale. All figures lie in a plane unless otherwise indicated.
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

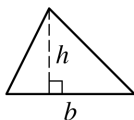


$$A = \pi r^2$$

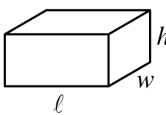
$$C = 2\pi r$$



$$A = \ell w$$



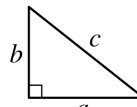
$$A = \frac{1}{2}bh$$



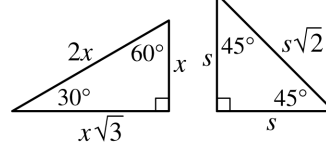
$$V = \ell wh$$



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



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



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 $4x + 4y = 18$ and $x = 2$, what is the value of $2y$?

(A) 5
(B) 7
(C) 9
(D) 10
(E) 16

2. A store will print an order of shirts with a special design. The store charges a one-time fee of \$200 for creating the artwork, plus \$6 for each shirt that it prints. Which of the following gives the total charge, in dollars, to print an order of n shirts?

(A) $194n$
(B) $200n + 6$
(C) $206 + n$
(D) $200 + 6n$
(E) $200 + n + 6$

GO ON TO THE NEXT PAGE



3. Point M is the midpoint of $\overline{AB}$. Points C and D are located on $\overline{AB}$ in such a way that $AC = CM$ and $MD = DB$. If $MD = 5$, what is the length AD ?

(A) 10
(B) 15
(C) 20
(D) 25
(E) 30

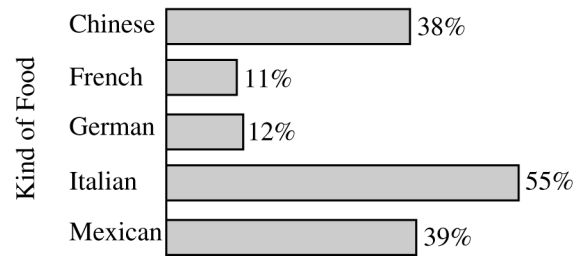
4. If $5^{k-2} + 5^2 = 50$, what is the value of k ?

(A) 2
(B) 4
(C) 5
(D) 10
(E) 20

5. For which of the following pairs of numbers is the ratio of the smaller number to the larger number 3 to 5?

(A) 4, 6
(B) 5, 10
(C) 6, 9
(D) 8, 8
(E) 9, 15

ETHNIC FOOD SURVEY



6. For each of 5 kinds of food, the graph above shows the percent of 800 people surveyed who said they enjoy that kind of food. Based on the information in the graph, which of the following statements must be true?

I. Some of the people said they enjoy more than one kind of food.
 II. More than half the people said they enjoy Italian food.
 III. All the people who said they enjoy Mexican food also said they enjoy Italian food.

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

7. If $\frac{5}{x+1} = \frac{5}{2x-1}$, what is the value of x ?

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



8. How many integers between 9 and 100 have the tens digit equal to 4 or 5 and the units digit (ones digit) equal to 7, 8, or 9?

(A) Two
(B) Three
(C) Four
(D) Six
(E) Nine

Sequence P : 2, 4, 8, ...

Sequence T : 10, 20, 30, ...

9. The first term of sequence P is 2, and each term after the first is 2 times the preceding term. The first term of sequence T is 10, and each term after the first is 10 more than the preceding term. What is the least value of n such that the n th term of sequence P is greater than the n th term of sequence T ?

(A) 6
(B) 7
(C) 8
(D) 9
(E) 10

10. For all positive integers a and b , let $a \diamond b$ be defined by $a \diamond b = ab^2$. What is the value of $2 \diamond 3$?

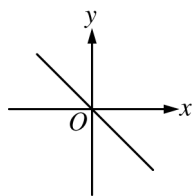
(A) 6
(B) 12
(C) 18
(D) 27
(E) 36

Lonnie sometimes goes to comedy movies.
Greta never goes to mystery movies.

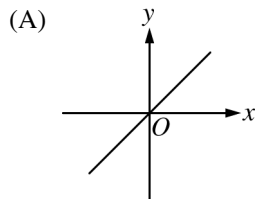
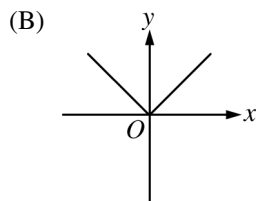
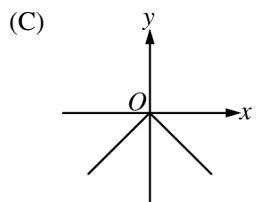
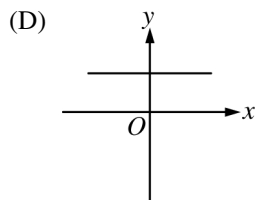
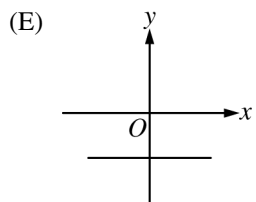
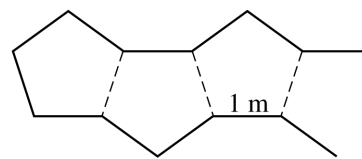
11. If the two statements above are true, which of the following statements must also be true?

I. Lonnie never goes to mystery movies.
II. Greta sometimes goes to comedy movies.
III. Lonnie and Greta never go to mystery movies together.

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



12. The figure above shows the graph of $y = f(x)$.
Which of the following is the graph of $y = |f(x)|$?



13. A garden consists of a continuous chain of flower beds in the shape of pentagons, the beginning of which is shown in the figure above. There are 17 flower beds in the chain, and each one, except the first and last, shares two of its sides with adjacent flower beds. If the length of each side of each bed is 1 meter, what is the perimeter of the garden?

- (A) 50 meters
(B) 51 meters
(C) 53 meters
(D) 55 meters
(E) 57 meters

14. If $y + x < y - x$, which of the following statements must be true?

- (A) $x > y$
(B) $y > x$
(C) $y = x$
(D) $x < 0$
(E) $y < 0$



15. If the average (arithmetic mean) of the measures of two noncongruent angles of an isosceles triangle is 70° , which of the following is the measure of one of the angles of the triangle?

(A) 50°
 (B) 60°
 (C) 80°
 (D) 90°
 (E) 100°

ANNA'S DAILY SERVINGS OF
FRUITS AND VEGETABLES

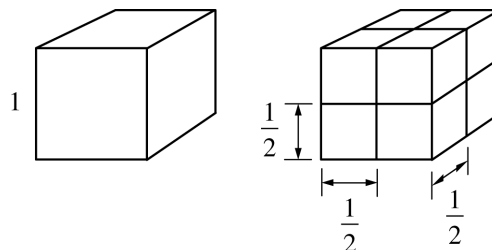
Day	Fruits	Vegetables
Monday	5	0
Tuesday	1	4
Wednesday	2	2
Thursday	3	2
Friday	3	3

16. A nutrition expert recommends that a person eat a minimum of 5 servings of fruits or vegetables a day; these 5 servings are to include at least 2 servings of fruit and at least 2 servings of vegetables. On how many days listed in the table above did Anna satisfy all the recommendations of the nutrition expert?

(A) One
 (B) Two
 (C) Three
 (D) Four
 (E) Five

17. If s is the sum of 3 consecutive odd integers and n is one of the 3 odd integers, which of the following could be true?

(A) $s = 3n$
 (B) $s = 3n + 3$
 (C) $s = 3n - 3$
 (D) $s = 6n$
 (E) $s = 6n + 1$



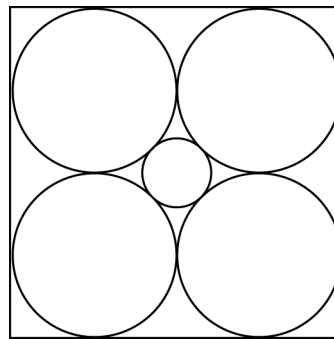
18. If a 1-inch cube of cheese were cut in half in all three directions as shown above, then the total surface area of the separated smaller cubes would be how much greater than the surface area of the original 1-inch cube?

(A) 2 square inches
 (B) 4 square inches
 (C) 6 square inches
 (D) 8 square inches
 (E) 12 square inches



19. If $w = x + y + z$, what is the average (arithmetic mean) of w , x , y , and z in terms of w ?

- (A) $\frac{w}{2}$
 (B) $\frac{w}{3}$
 (C) $\frac{w}{4}$
 (D) $\frac{w}{6}$
 (E) $\frac{w}{8}$



20. In the figure above, each of the four large circles is tangent to two of the other large circles, the small circle, and two sides of the square. If the radius of each of the large circles is 1, what is the radius of the small circle?

- (A) $\frac{1}{4}$
 (B) $\frac{1}{2}$
 (C) $\frac{\sqrt{2} - 1}{2}$ (approximately 0.207)
 (D) $\sqrt{2} - 1$ (approximately 0.414)
 (E) $\frac{\sqrt{2}}{2}$ (approximately 0.707)

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.