Sample Questions and Answers:

1. If x is an even integer, which of the following is an odd integer?

    (A) $3x + 2$
    (B) $7x$
    (C) $8x + 5$
    (D) x^2
    (E) x^3

2. On a purchase of $120, a store offered a payment plan consisting of a $20 down payment and 12 monthly payments of $10 each. What percent of the purchase price, to the nearest tenth of a percent, did the customer pay in interest by using this plan?

    (A) 16.7%
    (B) 30%
    (C) 75.8%
    (D) 106.7%
    (E) 107.5%

3. $\dfrac{5}{4}(42 \div \dfrac{3}{16}) =$
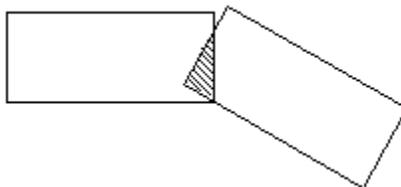
    (A) 6.3
    (B) 9.8
    (C) 179.2
    (D) 224
    (E) 280

4. When magnified 1,000 times by an electron microscope, the image of a certain circular piece of tissue has a diameter of 0.5 centimeter. The actual diameter of the tissue, in centimeters, is

    (A) 0.005
    (B) 0.002
    (C) 0.001
    (D) 0.0005
    (E) 0.0002

5. In 1970 there were 8,902 women stockbrokers in the United States. By 1978 the number had increased to 19,947. Approximately what was the percent increase?

    (A) 45%
    (B) 125%
    (C) 145%
    (D) 150%
    (E) 225%

6. In the figure above, two rectangles with the same dimensions overlap to form the shaded region. If each rectangle has perimeter 12 and the shaded region has perimeter 3, what is the total length of the heavy line segments?

(A) 15   (B) 18   (C) 21
(D) 22   (E) 23

7. If one root of the equation $2x^2 + 3x - k = 0$ is 6, what is the value of $k?$

(A) 90
(B) 42
(C) 18
(D) 10
(E) –10

8. Bottle R contains 250 capsules and costs $6.25. Bottle T contains 130 capsules and costs $2.99. What is the difference between the cost per capsule for bottle R and the cost per capsule for bottle T?

(A) $0.25
(B) $0.12
(C) $0.05
(D) $0.03
(E) $0.002

9. Trucking transportation rates are x dollars per metric ton per kilometer. How much does it cost, in dollars, to transport one dozen cars, which weigh two metric tons each, n kilometers by truck?

(A) $\dfrac{x}{12n}$

(B) $\dfrac{x}{24n}$

(C) $\dfrac{xn}{24}$

(D) $12xn$

(E) $24xn$

10. For a positive integer n, the number $n!$ is defined to be $n(n - 1)(n - 2)\ldots(1)$. For example, $4!=4(3)(2)(1)$. What is the value of $5!-3!?$

(A) 120   (B) 114   (C) 20
(D) 15   (E) 2

11. A man who died left an estate valued at $111,000. His will stipulated that his estate was to be distributed so that each of his three children received from the estate and his previous gifts, combined, the same total amount. If he had previously given his oldest child $15,000, his middle child $10,000, and his youngest $2,000, how much did the youngest child receive from the estate?

(A) $50,000
(B) $48,000
(C) $46,000
(D) $44,000
(E) $39,000

12. If $y > 0$, which of the following is equal to $\sqrt{48y^3}$

(A) $4y\sqrt{3y}$

(B) $3y\sqrt{4y}$

(C) $2\sqrt{12y}$

(D) $3\sqrt{8y}$

(E) $16y\sqrt{3y}$

13. The volume of a box with a square base is 54 cubic centimeters. If the height of the box is twice the width of the base, what is the height, in centimeters?

(A) 2
(B) 3
(C) 4
(D) 6
(E) 9

$$q = 3\sqrt{3}$$
$$r = 1 + 2\sqrt{3}$$
$$s = 3 + \sqrt{3}$$

14. If *q, r* and *s* are the numbers shown above, which of the following shows their order from greatest to least?

(A) q, r, s
(B) q, s, r
(C) r, q, s
(D) s, q, r
(E) s, r, q

15. The sum of the interior angles of any polygon with *n* sides is $180(n - 2)$ degrees. If the sum of the interior angles of polygon *P* is three times the sum of the interior angles of quadrilateral Q, how many sides does *P* have?

(A) 6   (B) 8   (C) 10
(D) 12   (E) 14

16. In Company *X*, 30 percent of the employees live over ten miles from work and 60 percent of the employees who live over ten miles from work are in car pools. If 40 percent of the employees of Company *X* are in car pools, what percent of the employees of Company *X* live ten miles or less from work and are in car pools?

(A) 12%
(B) 20%
(C) 22%
(D) 28%
(E) 32%

17. If an organization were to sell *n* tickets for a theater production, the total revenue from ticket sales would be 20 percent greater than the total costs of the production. If the organization actually sold all but 5 percent of the *n* tickets, the total revenue from ticket sales was what percent greater than the total costs of the production?

(A) 4%   (B) 10%   (C) 14%
(D) 15%   (E) 18%

18. When the integer *n* is divided by 6, the remainder is 3, Which of the following is NOT a multiple of 6?

(A) $n - 3$
(B) $n + 3$
(C) $2n$
(D) $3n$
(E) $4n$

19. How many liters of pure alcohol must be added to a 100-liter solution that is 20 percent alcohol in order to produce a solution that is 25 percent alcohol?

(A) $\dfrac{7}{2}$
(B) 5
(C) $\dfrac{20}{3}$
(D) 8
(E) $\dfrac{39}{4}$

20. If 10 persons meet at a reunion and each person shakes hands exactly once with each of the others, what is the total number of handshakes?

(A) $10 \cdot 9 \cdot 8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1$
(B) $10 \cdot 10$
(C) $10 \cdot 9$
(D) 45
(E) 36

Answers:
1. C
2. A
3. E
4. D
5. B
6. C
7. A
8. E
9. E
10. B
11. D
12. A
13. D
14. B
15. B
16. C
17. C
18. D
19. C
20. D