DSAT Math Module 1

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Digital SAT Math - 22 Questions

DIRECTIONS: In this section, you will find questions that cover various essential math skills. You are allowed to use a calculator for all of the questions. Unless stated otherwise, the following assumptions apply:

- All variables and expressions represent real numbers.
- The provided figures are accurately drawn to scale.
- All figures exist within a two-dimensional plane.
- The domain of a given function f is the set of all real numbers x for which $f(x)$ is also a real number.

1. What is 20% of 470?

   A) 84

   B) 90

   C) 100

   D) 94

2. If 2(2x + 3) = 18, what is the value of x?

   A) 6

   B) 2

   C) 4

   D) 3

3. A person rents a bicycle for t hours, paying a $20 service fee and a $12 per hour rental fee. If the person plans to spend at most $100 on the bicycle rental, which inequality represents this situation?

   A) $20 + 12t \leq 100$

   B) $20 + 12t \geq 100$

   C) $20 - 12t \leq 100$

   D) $20t + 12 \leq 100$

4. The function h is defined by $h(x) = x^2 - 4x + 4$. At which value of x is $h(x) = 0$?

   A) 1

   B) 2

   C) 3

   D) 4

5. A fair 10-sided die has each face labeled with a number from 1 through 10, with a different number appearing on each face. If the die is rolled one time, what is the probability of rolling a 5?

   A) 1/5

   B) 1/10

   C) 1/20

   D) 2/10

6. If $g(x) = 5x - 3$, what is the value of $g(3)$?

   A) 15

   B) 9

   C) 12

   D) 18

7. A group of students is organizing a bake sale to raise funds for their club. They plan to sell cookies for $1 each and brownies for $3 each. If they want to raise $100, which equation represents this situation, where x represents the number of cookies sold and y represents the number of brownies sold?

   A) $3x - 1y = 100$

   B) $1x - 3y = 100$

   C) $3x + 1y = 100$

   D) $1x + 3y = 100$

8. A test is worth 80 points and contains a mix of 2-point and 4-point questions. If x represents the number of 2-point questions and y represents the number of 4-point questions, which equation represents this situation?

   A) $2x + y = 80$

   B) $x + y = 80$

   C) $2x + 4y = 80$

   D) $x + 4y = 80$

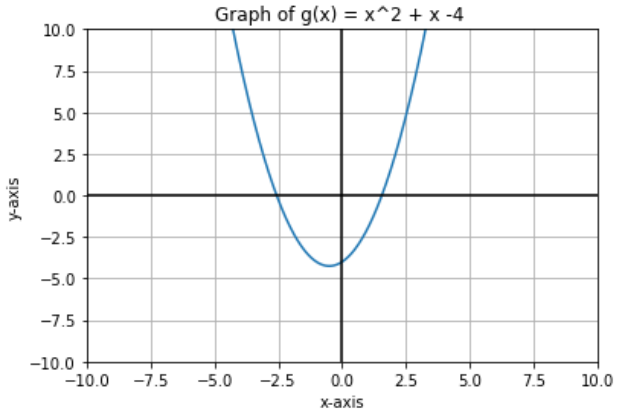
9. A line passes through the points (3, 4) and (7, 12). What is the slope of this line?

   A) 4

   B) 1

   C) 2

   D) -2



10. The graph of $y = g(x)$ is displayed, where $g(x) = x^2 + x - 4$. How many x-intercepts does the graph of $g(x)$ have?

A) 0

B) 2

C) 1

D) 3

11. Michael purchased pencils and notebooks for a total of $52. Each pencil cost $2 and each notebook cost $4. If Michael bought 12 pencils, how many notebooks did he buy?

    A) 6

    B) 7

    C) 8

    D) 9

12. If $3x - 5y = 12$, what is the value of x when $y = 2$?

    A) 20/3

    B) 22/3

    C) 24/3

    D) 18/3

13. A population of rabbits in a closed environment doubles every 6 months. If there are initially 500 rabbits, how many rabbits will there be after 2 years?

    A) 16000

    B) 4000

    C) 10000

    D) 8000

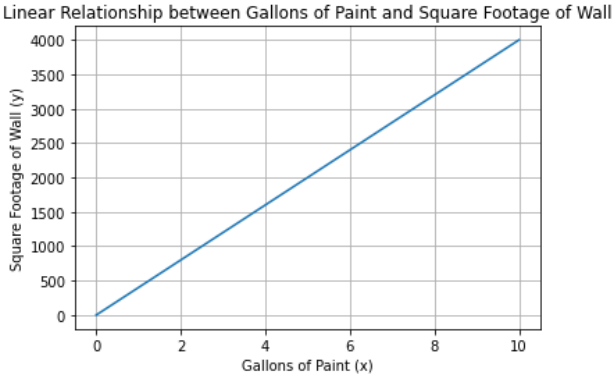
14. A school has 4 classrooms and an auditorium. The total number of chairs in the school is 1,280. The equation $4x + y = 1280$ represents this situation. What does x represent in this context?

A) The number of chairs in the auditorium

B) The number of chairs in each classroom

C) The total number of chairs in the school

D) The number of classrooms



15. A painter uses a specific type of paint that covers 400 square feet of a wall per gallon. If x represents the number of gallons of paint and y represents the square footage of the wall that can be covered, which equation represents the relationship between x and y?

A) $y = 400/x$

B) $y = 400x$

C) $y = x/400$

D) $y = 4x$

16. Triangle XYZ has side lengths of 3n, 4n, and 5n, where n is a positive constant. What is the area of triangle XYZ in terms of n?

A) $6n^2$

B) $3n^2$

C) $12n^2$

D) $7n^2$

17. A circle in the xy-plane has a diameter with endpoints (3, 5) and (3, 21). An equation of this circle is $(x - 3)^2 + (y - 13)^2 = r^2$, where r is a positive constant. What is the value of r?

A) 4

B) 8

C) 10

D) 16

18. The measure of angle A is $\pi/4$ radians. The measure of angle B is $7\pi/6$ radians greater than the measure of angle A. What is the measure of angle B, in degrees?

A) 285°

B) 225°

C) 255°

D) 315°

19. A rectangular garden has a length of 220 feet and a width of 165 feet. What is the area of the garden in square feet?

A) 38500

B) 36300

C) 34000

D) 40000

20. The equation of line r is $y = 3x - 2$. Line s is formed by translating line r to the right by 4 units in the xy-plane. What is the equation of line s?

A) $y = 3x - 6$

B) $y = 3x - 10$

C) $y = 3x + 2$

D) $y = 3x - 14$

21. In the xy-plane, the graph of the equation $y = 3x^2 - 5x + 7$ intersects the line y = k at exactly one point. What is the value of k?

A) 79/12

B) 49/12

C) 69/12

D) 59/12

22. If $3x - 4y = 12$ and $9x - 12y = 36$, which point (x, y) is a solution to the system of equations?

A) Infinitely many solutions along the line $3x - 4y = 12$

B) (2, -1)

C) (4, 3)

D) No solution