1. Algebra:
    - Question: Solve for x: $2x + 5 = 11$
    - Answer: $x = 3$
    - Explanation: Subtract 5 from both sides: $2x = 6$. Divide both sides by 2: $x = 3$.
2. Trigonometry:
    - Question: What is the value of $\sin(30°)$?
    - Answer: 1/2
    - Explanation: In a right-angled triangle with an angle of 30°, the sine of that angle is the ratio of the length of the side opposite the angle to the length of the hypotenuse, which is 1/2.
3. Geometry:
    - Question: What is the formula for the area of a rectangle with length 'l' and width 'w'?
    - Answer: Area = $l \times w$
    - Explanation: The area of a rectangle is calculated by multiplying its length by its width.
4. Calculus:
    - Question: What is the derivative of x^2 with respect to x?
    - Answer: $2x$
    - Explanation: Using the power rule of differentiation, the derivative of x^n is nx^{n-1}. For x^2, $n = 2$, so the derivative is $2x^{2-1} = 2x$.
5. Statistics:
    - Question: What is the mean of the numbers 2, 4, 6, and 8?
    - Answer: 5
    - Explanation: The mean is calculated by summing the numbers and dividing by the count of the numbers. $(2 + 4 + 6 + 8) / 4 = 20 / 4 = 5$.
6. Number Systems:
    - Question: What is the value of 5! (5 factorial)?
    - Answer: 120
    - Explanation: $5! = 5 \times 4 \times 3 \times 2 \times 1 = 120$.
7. Sets and Relations:
    - Question: If $A = \{1, 2, 3\}$ and $B = \{3, 4, 5\}$, what is the union of A and B ($A \cup B$)?
    - Answer: $\{1, 2, 3, 4, 5\}$
    - Explanation: The union of two sets contains all the elements that are in either set A or set B or both.
8. Probability:
    - Question: What is the probability of getting a head when a fair coin is tossed once?
    - Answer: 1/2
    - Explanation: There are two possible outcomes (head or tail), and only one is a head. Probability = (favorable outcomes) / (total possible outcomes) = 1/2.
9. Coordinate Geometry:
    - Question: What is the distance between the points (1, 2) and (4, 6)?
    - Answer: 5 units
    - Explanation: Using the distance formula: $\sqrt{((x_2 - x_1)^2 + (y_2 - y_1)^2)}$. Distance = $\sqrt{((4 - 1)^2 + (6 - 2)^2)} = \sqrt{(3^2 + 4^2)} = \sqrt{(9 + 16)} = \sqrt{25} = 5$.
10. Logarithms:

- Question: What is the value of $\log_{10}(100)$?
- Answer: 2
- Explanation: $\log_{10}(100)$ asks, "to what power must 10 be raised to get 100?" The answer is 2 since $10^2 = 100$.

11. Linear Equations:
    - Question: What is the slope of the line represented by the equation $y = 3x - 2$?
    - Answer: 3
    - Explanation: In the slope-intercept form of a linear equation ($y = mx + c$), 'm' represents the slope. Here, $m = 3$.
12. Quadratic Equations:
    - Question: What are the roots of the quadratic equation $x^2 - 5x + 6 = 0$?
    - Answer: $x = 2$ and $x = 3$
    - Explanation: Factoring the quadratic equation, we get $(x - 2)(x - 3) = 0$. Therefore, the roots are $x = 2$ and $x = 3$.
13. Inequalities:
    - Question: Solve the inequality: $2x - 1 < 5$
    - Answer: $x < 3$
    - Explanation: Add 1 to both sides: $2x < 6$. Divide both sides by 2: $x < 3$.
14. Matrices:
    - Question: If A = [[1, 2], [3, 4]], what is the determinant of A?
    - Answer: -2
    - Explanation: The determinant of a 2x2 matrix [[a, b], [c, d]] is ad - bc. For A, determinant = (1 * 4) - (2 * 3) = 4 - 6 = -2.
15. Sequences and Series:
    - Question: What is the next term in the arithmetic progression 2, 5, 8, ...?
    - Answer: 11
    - Explanation: The common difference between consecutive terms is 5 - 2 = 3. So, the next term is 8 + 3 = 11.
16. Permutations and Combinations:
    - Question: How many different ways can you arrange the letters in the word "CAT"?
    - Answer: 6
    - Explanation: There are 3 distinct letters, so the number of permutations is $3! = 3 \times 2 \times 1 = 6$.
17. Ratio and Proportion:
    - Question: If the ratio of boys to girls in a class is 2:3, and there are 20 boys, how many girls are there?
    - Answer: 30 girls
    - Explanation: Let the number of girls be 'x'. Then, $2/3 = 20/x$. Cross-multiplying gives $2x = 60$, so $x = 30$.
18. Mensuration:
    - Question: What is the formula for the circumference of a circle with radius 'r'?
    - Answer: Circumference = $2\pi r$
    - Explanation: The circumference is the total distance around the circle.
19. Statistics:

- Question: What is the median of the numbers 1, 3, 5, 2, 4?
- Answer: 3
- Explanation: First, arrange the numbers in ascending order: 1, 2, 3, 4, 5. The median is the middle value, which is 3.

20. Complex Numbers:
    - Question: What is the real part of the complex number 3 + 4i?
    - Answer: 3
    - Explanation: A complex number is in the form a + bi, where 'a' is the real part and 'b' is the imaginary part. Here, the real part is 3.
21. Polynomials:
    - Question: What is the degree of the polynomial $5x^3 - 2x + 7$?
    - Answer: 3
    - Explanation: The degree of a polynomial is the highest power of the variable in the polynomial. Here, the highest power of x is 3.
22. Trigonometry:
    - Question: What is the value of $\cos(0°)$?
    - Answer: 1
    - Explanation: The cosine of 0 degrees is the ratio of the adjacent side to the hypotenuse in a right-angled triangle where the angle is 0 degrees.
23. Geometry:
    - Question: What is the sum of the interior angles of a triangle?
    - Answer: 180 degrees
    - Explanation: This is a fundamental property of triangles in Euclidean geometry.
24. Calculus:
    - Question: What is the integral of 2x concerning x?
    - Answer: $x^2 + C$
    - Explanation: The integral of x^n is $(x^{n+1}) / (n+1) + C$. For 2x, n = 1, so the integral is $(2x^2) / 2 + C = x^2 + C$, where C is the constant of integration.