Mathematics Functions and Trigonometry Review

Mathematics · Practice Test · 23 Questions

1. What is the general form of a quadratic function?

A) y = ax + b
B) y = a(x-p)^2 + q
C) y = ab^x
D) y = mx + c

2. What does 'a' represent in the vertex form of a parabola, y = a(x-p)^2 + q?

A) The y-coordinate of the turning point
B) The x-coordinate of the turning point
C) The concavity and width of the parabola
D) The y-intercept

3. If 'a' is positive in a quadratic function, the parabola is:

A) Concave down
B) Concave up
C) A straight line
D) A hyperbola

4. What is the domain of a quadratic function?

A) y >= q
B) y <= q
C) xER
D) x > 0

5. What is the range of a quadratic function with a positive 'a' and turning point (p, q)?

A) y <= q
B) y >= q
C) xER
D) yER

6. What is the turning point of the parabola y = -2(x-2)^2 + 8?

A) (2, 8)
B) (-2, 8)
C) (2, -8)
D) (-2, -8)

7. What is the length of OD if O is (0,0) and D is (-4,0)?

A) 2 units
B) 4 units
C) 8 units
D) 12 units

8. For an exponential function y = a * b^x, what is the condition for b?

A) b > 0
B) b < 0
C) b = 1
D) b > 1

9. What is the characteristic of the graph of an exponential function where b > 1?

A) It extends indefinitely in the negative x-direction
B) It has a horizontal asymptote at y=0
C) It decreases as x increases
D) It has a vertical asymptote

10. What is the range of an exponential function y = a * b^x where b > 1 and a > 0?

A) y <= 0
B) y < 0
C) y > 0
D) yER

11. What is the Sine Rule used for?

A) Finding the area of a triangle
B) Relating sides and angles in any triangle
C) Calculating the cosine of an angle
D) Solving quadratic equations

12. The Sine Rule states: a/sin A = b/sin B = c/sin C. When is it typically applied?

A) When two sides and the included angle are known
B) When two angles and one side are known
C) When all three sides are known
D) When it's a right-angled triangle

13. What is the formula for the area of a triangle using trigonometry if two sides and the included angle are known?

A) 1/2 * base * height
B) 1/2 * ab * sin C
C) sqrt(s(s-a)(s-b)(s-c))
D) a^2 + b^2 = c^2

14. What is the general form of a hyperbola function mentioned in the text?

A) y = ax^2 + bx + c
B) y = a * b^x
C) y = a/x
D) y = ab^x + c

15. For a hyperbola function, what are the possible values for the range if the graph is positive?

A) y > q
B) y < q
C) yER
D) y != 0

16. What is the axis of symmetry for a hyperbola function when it's negative?

A) Positive axis of symmetry
B) Negative axis of symmetry
C) y-axis
D) x-axis

17. In the context of sketching a parabola y = ax^2 + bx + c, if a > 0, b < 0, and c > 0, what does this suggest about the graph?

A) The parabola opens downwards and has no real roots
B) The parabola opens upwards and has a positive y-intercept
C) The parabola opens downwards and has a negative y-intercept
D) The parabola opens upwards and has no real roots

18. If b^2 - 4ac < 0 for a quadratic equation, what does this imply about the roots of the quadratic function?

A) Two distinct real roots
B) One repeated real root
C) No real roots
D) Infinitely many roots

19. What is the condition for a function to be concave down?

A) The second derivative is positive
B) The second derivative is negative
C) The first derivative is positive
D) The first derivative is negative

20. What does 'vertical shift' refer to in function transformations?

A) Moving the graph left or right
B) Moving the graph up or down
C) Stretching or compressing the graph
D) Reflecting the graph

21. What is the 'simple form' of an exponential function mentioned?

A) y = ax^2 + bx + c
B) y = a(x-p)^2 + q
C) y = a * b^x
D) y = mx + c

22. What is the definition of 'domain' in the context of functions?

A) The set of all possible output values (y-values)
B) The set of all possible input values (x-values)
C) The turning point of the graph
D) The y-intercept

23. What is the definition of 'range' in the context of functions?

A) The set of all possible input values (x-values)
B) The set of all possible output values (y-values)
C) The x-intercept
D) The slope of the graph