

Ninth Grade - Quadratic Functions



1) Identify the vertex of the graph. Tell whether it is a minimum or maximum.

2) Which of the quadratic functions has the narrowest graph?



- y = 1/3x
- y = 1/7x²
- y = -4x²
- y = -3x²

3) If an object is dropped from a height of 39 feet, the function $h(t) = ?16t^2 + 39$ gives the height of the object after t seconds. Graph the function.



4) A ball is thrown into the air with an upward velocity of 48 ft/s. Its height h in feet after t seconds is given by the function $h = ?16t^2 + 48t + 8$. In how many seconds does the ball reach its maximum height? Round to the nearest hundredth if necessary. What is the ball's maximum height?

- 1.5 secs, 56 ft
- 1.5 secs, 44 ft
- 3 secs, 8 ft
- 1.5 secs, 116 ft

5) Solve the equation: $x^2 - 15 = 34$

- ±7
- 7
- ±49
- No real number solutions

6) Solve (x - 8)(4x + 2) = 0 using the Zero Product Property.

- x = -8, -1/2
- x = -8, 1/2
- x = 8, -1/2
- x = 8, 1/2

7) Solve the equation by factoring: z^2 ? 4z?12 = 0

- z = -6, -2
- z = 6, 2
- z = 6,-2
- z = -6, 2



8) Solve the equation by completing the square: $x^2 + 2x - 6 = 0$

- -1.65, 3.65
- - 8, 6
- 1.86, 3.86
- 2.24, 2.65

9) Use the Quadratic Formula to solve the following equations. $2a^2 - 46a + 252 = 0$

- 9, 14
- 18, 28
- - 18, 28
- - 9, 14

10) Use the Quadratic Formula to solve the following equations. $x^2 + 6x + 18 = 0$

- -3 ± 3.3
- -3 ±?-3
- No solution
- 0,-6

11) A rocket is launched from a top of 56-foot cliff with an initial velocity of 135 ft/s. Substitute the values into the vertical motion formula $h = -16t^2 + vt + c$. Let h = 0. Use the quadratic formula find out how long the rocket will take to hit the ground after it is launched. Round to the nearest tenth of a second.

- 0 = 16t² + 56t + 135; 8.8 s
- 4.8 s
- 0 = 16t² + 135t + 56; 4.8 s
- $0 = -16t^2 + 56t + 135; 0.4 s$

12) For which discriminant is the graph possible?





- None of these
- $b^2 4ac = 0$
- b² 4ac = 4
- b² 4ac = 9

13) Find the number of real solutions for the following equations. $x^2 - 12x + 36 = 0$

- 0
- None of these
- 2
- 1

14) Find the number of real solutions for the following equations. $x^2 - 5 = 0$

- 0
- None of these
- 1
- 20

15) Use the following functions to answer the questions: f(x) = 3x ? 2, $g(x) = 3x^2 + 2x^2 1$, h(x) = 4x + 8 and $k(x) = 2x^2 - x ? 9$. Find (f/h)when x = 2.

- 4
- 2
- 1/4
- 1

16) Use the following functions to answer the questions : f(x) = 3x - 2, $g(x) = 3x^2 + 2x - 1$, h(x) = 4x + 8 and $k(x) = 2x^2 - x - 9.17$. Find $f(x) \times h(x)$.

- 12x² 16
- 12x² + 16x 16
- $12x^2 + 32x + 16$
- 12x² + 32x 16

17) Use the following functions to answer the next set of questions : f(x) = 3x - 2, $g(x) = 3x^2 + 2x - 1$, h(x) = 4x + 8 and $k(x) = 2x^2 - x - 9$. Find g(x) + k(x).

- -5x² x +10
- x² + 3x +8
- 5x² + x -10
- -x² 3x 8

18) Use the following functions to answer the next set of questions : f(x) = 3x ? 2, $g(x) = 3x^2 + 2x ? 1$, h(x) = 4x + 8 and $k(x) = 2x^2 - x ? 9$. Find (g - k)(3)

- 26
- 24
- 86
- 38

19) Find the equation of the axis of symmetry and the coordinates of the vertex of the graph of $y = 4x^2 + 5x - 1$

- x = 5/8, Vertex : (5/8, 37/8)
- x = -5/8, Vertex : (-5/8, -91/16)
- x = 5/8, Vertex : (5/8, 59/16)
- x = -5/8, Vertex : (5/8,-41/16)

20) Suppose you have 56 feet of fencing to enclose a rectangular dog pen. The function $A = 28x - x^2$, where x = width, gives you the area of the dog pen in square feet. What width gives you the maximum area? What is the maximum area? Round to the nearest tenth as necessary.

- Width = 14ft; Area = 588ft²
- Width = 28ft; Area = 420ft²
- Width = 14ft; Area = 196ft²
- Width = 28ft; Area = 196ft²

21) Solve the equation: $x^2 + 20 = 4$

- ± 24
- No real number solutions
- 24
- -4

22) Find the zeros of the function $h(x) = x^2 - 15x + 50$ by factoring



- x = -2 or 25
- x = -10 or -5
- x = 2 or 25
- x = 10 or 5

23) Find the vertex of the graph of the quadratic function : $y = x^2 - 3$

- (0,3)
- (0,-3)
- (3,0)
- (-3,0)

24) Identify the vertex of the quadratic function : $f(x) = (x - 4)^2 - 5$

- (4,-5)
- (-5,4)
- (0,4)
- (-5,0)

25) Find the equation of the quadratic function that has the given vertex and given point on its graph. Vertex: (-4,-4) point: (-3,-5)

- $P(x) = -x^2 + 4x 4$
- $P(x) = x^2 + 8x + 4$
- $P(x) = -x^2 8x 20$
- $P(x) = x^2 + 8x 4$

26) Find the equation of the axis of symmetry of the quadratic function: $y = (x + 1)^2 + 8$

- y = 0
- y = -1
- x = -1
- x =1

27) Find the maximum or minimum point of the function $f(x) = x^2 + 14x + 40$ and state whether it is a maximum or minimum

- (-9,-7); maximum
- (-7,-9); minimum
- (0,-7); maximum
- (-9,0); minimum

28) Solve the equation $10z^2 + 3z - 3 = 0$

a)
$$\frac{-3 \pm \sqrt{129}}{20}$$
 b) $\frac{-5 \pm \sqrt{149}}{10}$ c) $\frac{-2 \pm \sqrt{139}}{30}$ d) $\frac{-4 \pm \sqrt{124}}{24}$
 $\stackrel{c}{\underset{a}{}{}}_{}$

29) Evaluate the discriminant, and predict the type and number of solutions of $s^2 + 3s + 8 = 0$

- 0, one rational
- 23, two different rational
- 23, two different irrational
- -23, two different imaginary

30) Write a quadratic equation in the form $ax^2 + bx + c = 0$ that has the solutions(roots)5,and -3

- $x^2 15x + 2 = 0$
- $x^2 15x 2 = 0$
- $x^2 + 2x 15 = 0$
- $x^2 2x 15 = 0$