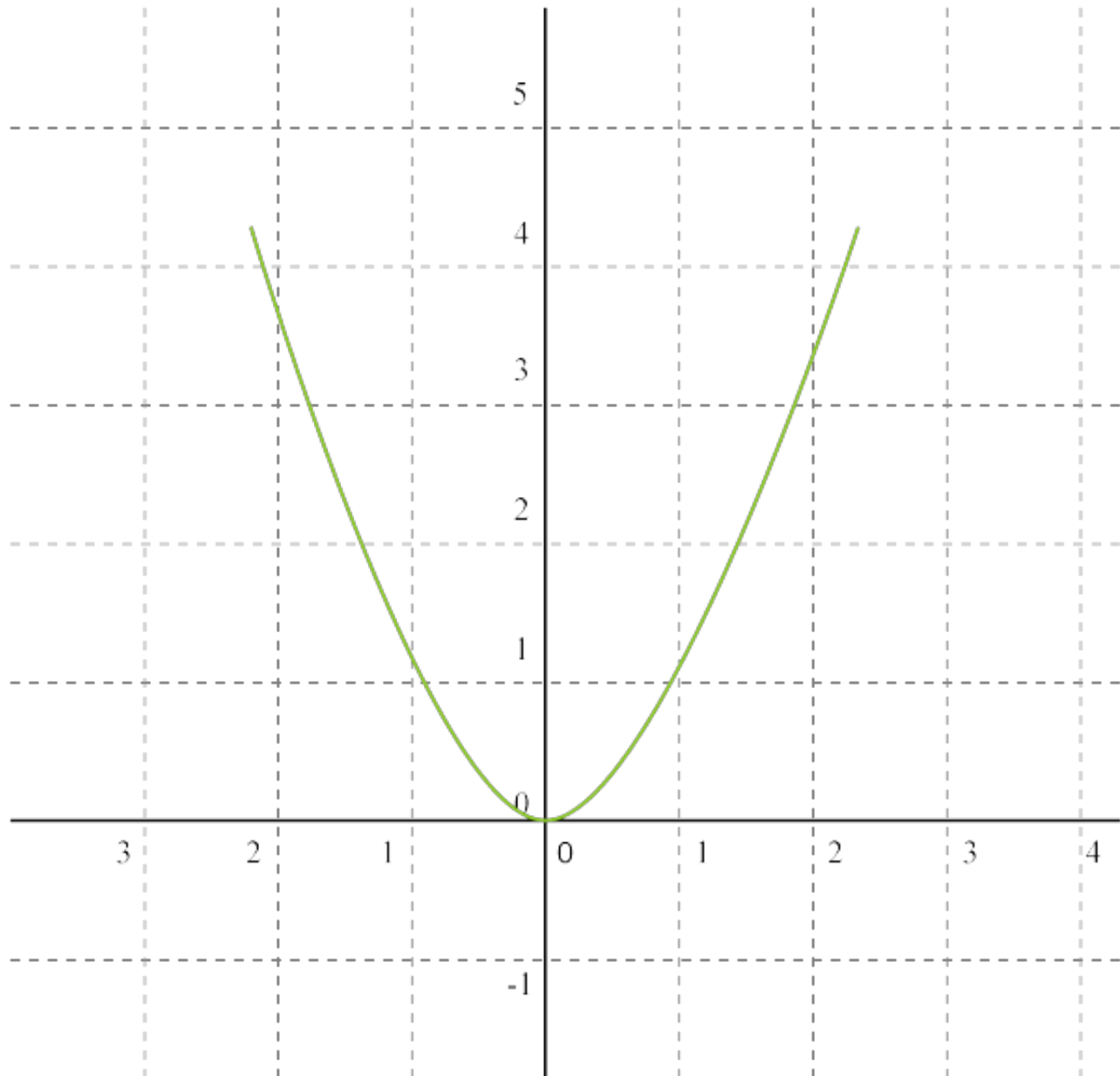




Ninth Grade - Quadratic Functions

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



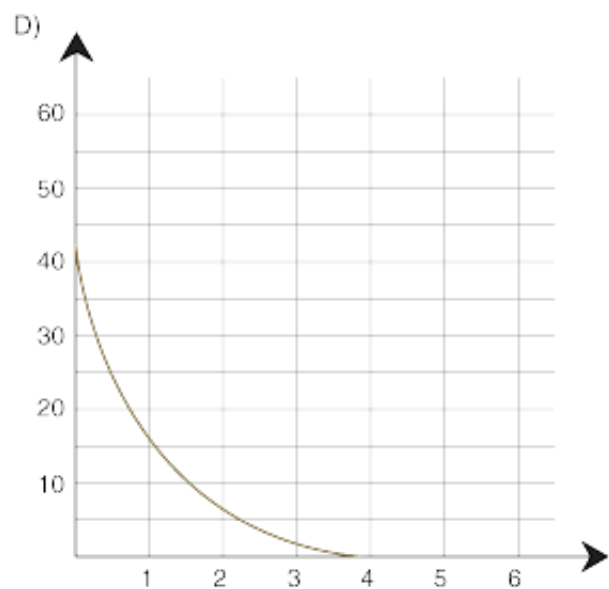
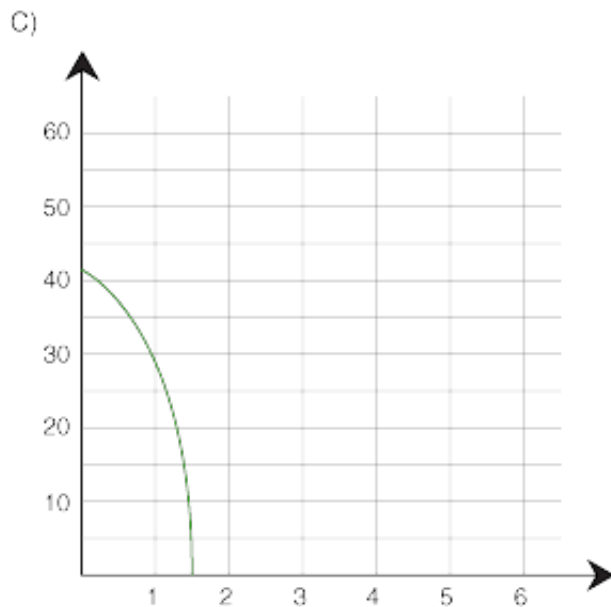
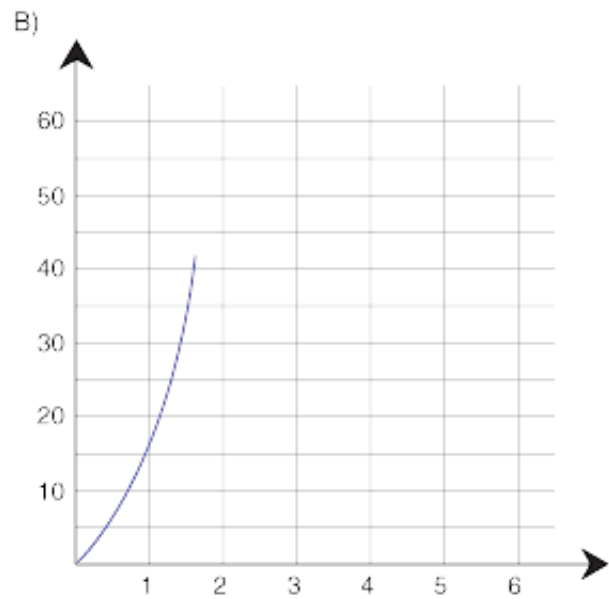
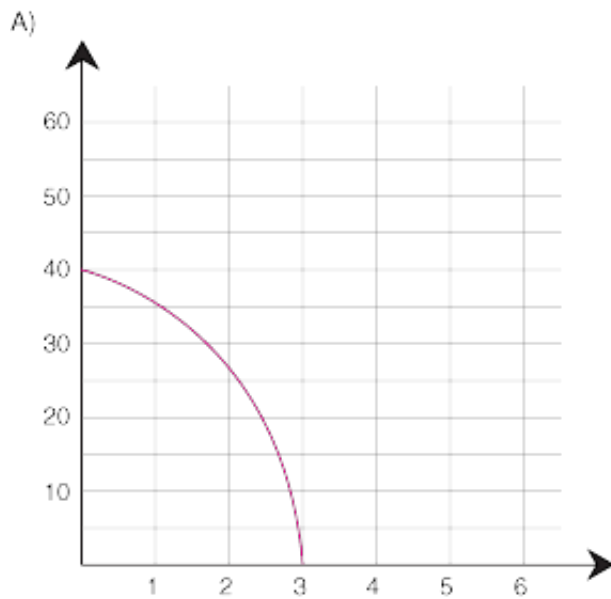
- (0, 1) minimum
- (0, 1) maximum
- (0, 0) maximum
- (0, 0) minimum

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



- $y = 1/3x$
- $y = -3x^2$
- $y = -4x^2$
- $y = 1/7x^2$

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.



- b
- a
- c
- d



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

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

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

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: $x^2 + 2x - 6 = 0$

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

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

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

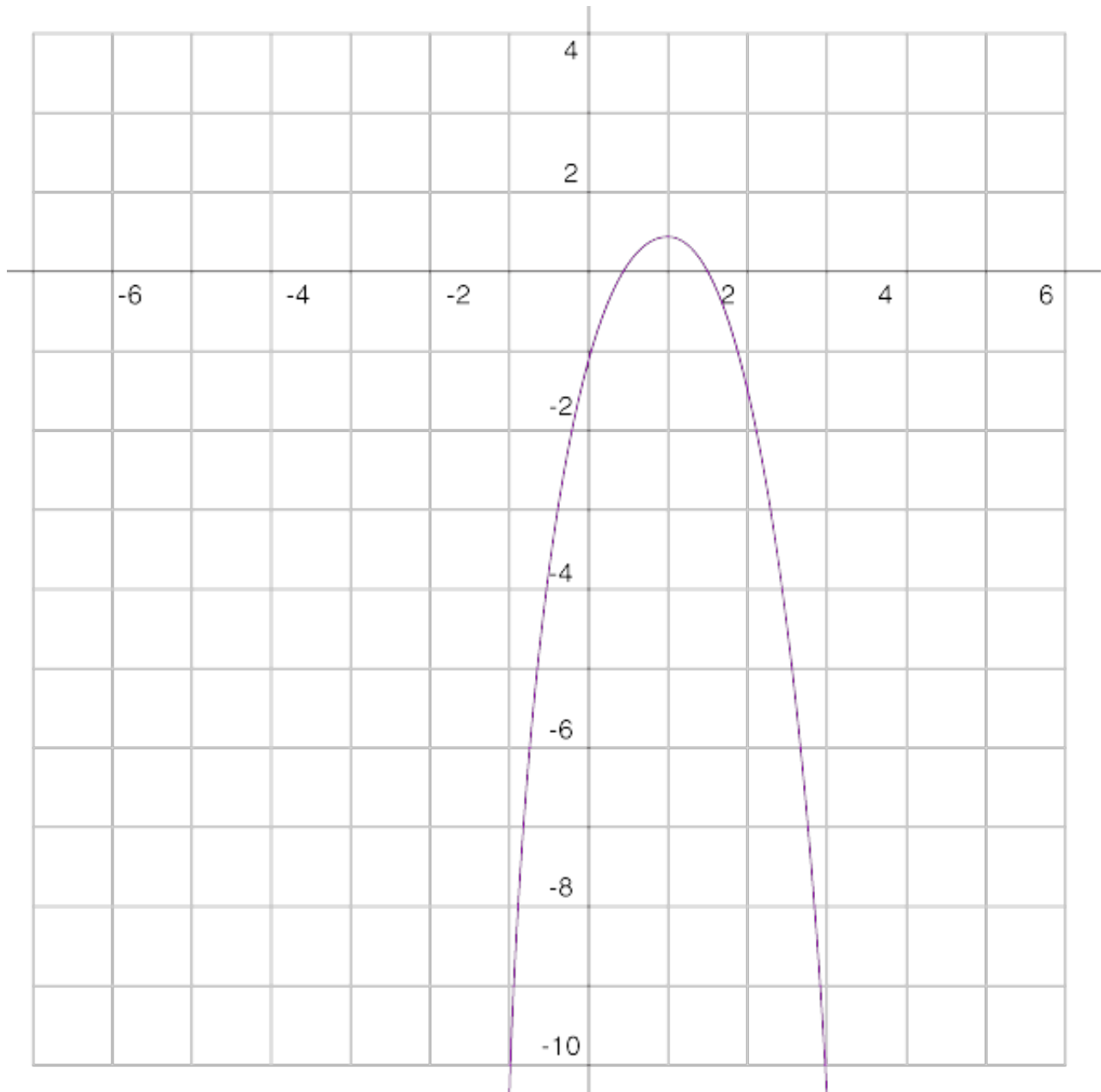
10) Use the Quadratic Formula to solve the following equations. $x^2 + 6x + 18 = 0$

- -3 ± 3.3
- 0 , -6
- No solution
- $-3 \pm \sqrt{-3}$

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.

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

12) For which discriminant is the graph possible?



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

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

- 2
- 1
- 0
- None of these



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

- 20
- 1
- 0
- None of these

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

- 1
- $1/4$
- 4
- 2

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

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

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 $g(x) + k(x)$.

- $5x^2 + x - 10$
- $x^2 + 3x + 8$
- $-x^2 - 3x - 8$
- $-5x^2 - x + 10$



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 $(g - k)(3)$

- 86
- 24
- 26
- 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 : $(5/8, -41/16)$
- $x = -5/8$, Vertex : $(-5/8, -91/16)$
- $x = 5/8$, Vertex : $(5/8, 37/8)$
- $x = 5/8$, Vertex : $(5/8, 59/16)$

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

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

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

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



- $x = -10$ or -5
- $x = 2$ or 25
- $x = -2$ 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 : $f(x) = (x - 4)^2 - 5$

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

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

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

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

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



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

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

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

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

- a
- b
- d
- c

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

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

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

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