

A.A.41: Identifying the Vertex of a Quadratic Given Equation 2

www.jmap.org

A.A.41: Identifying the Vertex of a Quadratic Given Equation 2: Determine the vertex and axis of symmetry of a parabola, given its equation

- 1 What is the turning point, or vertex, of the parabola whose equation is $y = 3x^2 + 6x - 1$?
 - 1) (1, 8)
 - 2) (-1, -4)
 - 3) (-3, 8)
 - 4) (3, 44)
- 2 What are the coordinates of the turning point of the parabola whose equation is $y = -x^2 + 4x + 1$?
 - 1) (-2, -11)
 - 2) (-2, -3)
 - 3) (2, 5)
 - 4) (2, 13)
- 3 What is the minimum point of the graph of the equation $y = 2x^2 + 8x + 9$?
 - 1) (2, 33)
 - 2) (2, 17)
 - 3) (-2, -15)
 - 4) (-2, 1)
- 4 The height of a swimmer's dive off a 10-foot platform into a diving pool is modeled by the equation $y = 2x^2 - 12x + 10$, where x represents the number of seconds since the swimmer left the diving board and y represents the number of feet above or below the water's surface. What is the farthest depth below the water's surface that the swimmer will reach?
 - 1) 6 feet
 - 2) 8 feet
 - 3) 10 feet
 - 4) 12 feet
- 5 A model rocket is launched from ground level. Its height, h meters above the ground, is a function of time t seconds after launch and is given by the equation $h = -4.9t^2 + 68.6t$. What would be the maximum height, to the nearest meter, attained by the model?
 - 1) 243
 - 2) 242
 - 3) 241
 - 4) 240
- 6 When a current, I , flows through a given electrical circuit, the power, W , of the circuit can be determined by the formula $W = 120I - 12I^2$. What amount of current, I , supplies the maximum power, W ?

A.A.41: Identifying the Vertex of a Quadratic Given Equation 2

www.jmap.org

- 7 The equation $W = 120I - 12I^2$ represents the power (W), in watts, of a 120-volt circuit having a resistance of 12 ohms when a current (I) is flowing through the circuit. What is the maximum power, in watts, that can be delivered in this circuit?

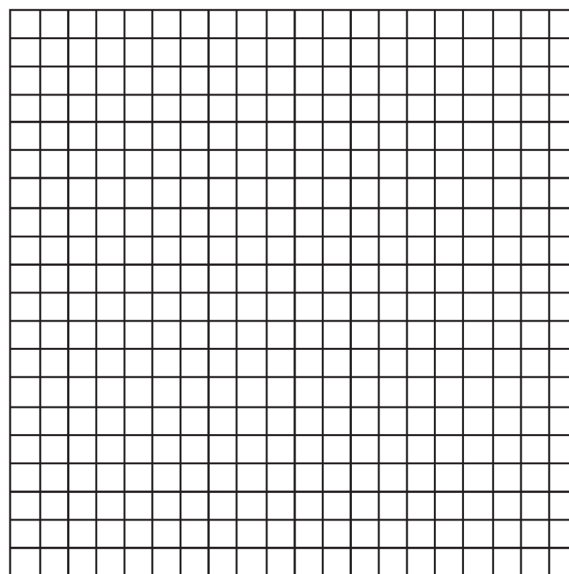
- 8 For which quadratic equation is the axis of symmetry $x = 3$?

- 1) $y = -x^2 + 3x + 5$
- 2) $y = -x^2 + 6x + 2$
- 3) $y = x^2 + 6x + 3$
- 4) $y = x^2 + x + 3$

- 9 An equation of a parabola that has $x = -2$ as its axis of symmetry is

- 1) $y = x^2 - 4x + 1$
- 2) $y = x^2 - 2x + 3$
- 3) $y = 2x^2 + 8x - 3$
- 4) $y = 2x^2 + 4x - 7$

- 10 A laundry owner's estimate of her weekly profits, p , in dollars, is given by the equation $p = -4w^2 + 160w$, where w represents the number of workers she hires. What is the number of workers she should hire in order to earn the greatest profit? [The use of the accompanying grid is optional.]

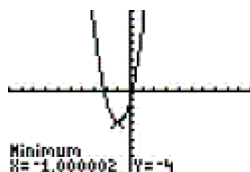


A.A.41: Identifying the Vertex of a Quadratic Given Equation 2: Determine the vertex and axis of symmetry of a parabola, given its equation
Answer Section

1 ANS: 2

$$x = \frac{-b}{2a} = \frac{-(6)}{2(3)} = -1$$

$$y = 3(-1)^2 + 6(-1) - 1 = -4$$



REF: 080501b

2 ANS: 3

$$x = \frac{-b}{2a} = \frac{-(4)}{2(-1)} = 2$$

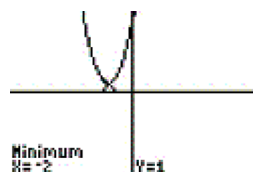
$$y = -(2)^2 + 4(2) + 1 = 5$$

REF: 080902b

3 ANS: 4

$$x = \frac{-b}{2a} = \frac{-(8)}{2(2)} = -2$$

$$y = 2(-2)^2 + 8(-2) + 9 = 1$$



REF: 080603b

4 ANS: 2

$$x = \frac{-b}{2a} = \frac{-(-12)}{2(2)} = 3$$

$$y = 2(3)^2 - 12(3) + 10 = -8$$

REF: 010907b

5 ANS: 4

$$x = \frac{-68.6}{2(-4.9)} = \frac{-(8)}{2(2)} = 7$$

$$y = -4.9(7)^2 + 68.6(7) = 240.1$$

REF: fall9915b

6 ANS:

$$5. I = \frac{-b}{2a} = \frac{-(120)}{2(-12)} = 5$$

REF: 010424b

7 ANS:

$$300. I = \frac{-b}{2a} = \frac{-(120)}{2(-12)} = 5$$

$$W = 120(5) - 12(5)^2 = 300$$

REF: 060225b

8 ANS: 2

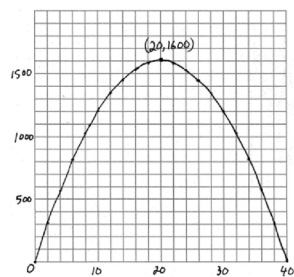
$$x = \frac{-b}{2a} = \frac{-(6)}{2(-1)} = 3$$

REF: 060514b

9 ANS: 3

REF: 011004b

10 ANS:



$$20. W = \frac{-160}{2(-4)} = 20.$$

REF: 060822b