

A.A.41: Identifying the Vertex of a Quadratic Given Equation 1

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A.A.41: Identifying the Vertex of a Quadratic Given Equation 1: Determine the vertex and axis of symmetry of a parabola, given its equation

- 1 Which equation represents the axis of symmetry of the graph of the equation $y = x^2 + 4x - 5$?
 - 1) $x = -2$
 - 2) $x = 4$
 - 3) $y = -2$
 - 4) $y = 4$
- 2 What are the vertex and axis of symmetry of the parabola $y = x^2 - 16x + 63$?
 - 1) vertex: $(8, -1)$; axis of symmetry: $x = 8$
 - 2) vertex: $(8, 1)$; axis of symmetry: $x = 8$
 - 3) vertex: $(-8, -1)$; axis of symmetry: $x = -8$
 - 4) vertex: $(-8, 1)$; axis of symmetry: $x = -8$
- 3 What is an equation of the axis of symmetry of the parabola represented by $y = -x^2 + 6x - 4$?
 - 1) $x = 3$
 - 2) $y = 3$
 - 3) $x = 6$
 - 4) $y = 6$
- 4 The equation of the axis of symmetry of the graph of $y = 2x^2 - 3x + 7$ is
 - 1) $x = \frac{3}{4}$
 - 2) $y = \frac{3}{4}$
 - 3) $x = \frac{3}{2}$
 - 4) $y = \frac{3}{2}$
- 5 What is the vertex of the graph of the equation $y = 3x^2 + 6x + 1$?
 - 1) $(-1, -2)$
 - 2) $(-1, 10)$
 - 3) $(1, -2)$
 - 4) $(1, 10)$
- 6 What is the vertex of the parabola represented by the equation $y = -2x^2 + 24x - 100$?
 - 1) $x = -6$
 - 2) $x = 6$
 - 3) $(6, -28)$
 - 4) $(-6, -316)$
- 7 The vertex of the parabola $y = x^2 + 8x + 10$ lies in Quadrant
 - 1) I
 - 2) II
 - 3) III
 - 4) IV
- 8 The height, y , of a ball tossed into the air can be represented by the equation $y = -x^2 + 10x + 3$, where x is the elapsed time. What is the equation of the axis of symmetry of this parabola?
 - 1) $y = 5$
 - 2) $y = -5$
 - 3) $x = 5$
 - 4) $x = -5$
- 9 Find algebraically the equation of the axis of symmetry and the vertex of the parabola represented by the equation $y = -x^2 - 2x + 1$.
- 10 Find algebraically the equation of the axis of symmetry and the coordinates of the vertex of the parabola whose equation is $y = -2x^2 - 8x + 3$.

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Answer Section

1 ANS: 1

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

REF: 011520ia

2 ANS: 1

$$x = \frac{-b}{2a} = \frac{-(-16)}{2(1)} = 8. \quad y = (8)^2 - 16(8) + 63 = -1$$

REF: 060918ia

3 ANS: 1

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

REF: 011127ia

4 ANS: 1

$$x = \frac{-b}{2a} = \frac{-(-3)}{2(2)} = \frac{3}{4}.$$

REF: 011219ia

5 ANS: 1

$$x = \frac{-b}{2a} = \frac{-6}{2(3)} = -1. \quad y = 3(-1)^2 + 6(-1) + 1 = -2$$

REF: 011416ia

6 ANS: 3

$$x = \frac{-b}{2a} = \frac{-24}{2(-2)} = 6. \quad y = -2(6)^2 + 24(6) - 100 = -28$$

REF: 061214ia

7 ANS: 3

$$x = \frac{-b}{2a} = \frac{-8}{2(1)} = -4. \quad y = (-4)^2 + 8(-4) + 10 = -6. \quad (-4, -6)$$

REF: 011314ia

8 ANS: 3

$$x = \frac{-b}{2a} = \frac{-10}{2(-1)} = 5.$$

REF: 081018ia

9 ANS:

$$x = \frac{-(-2)}{2(-1)} = \frac{2}{-2} = -1 \quad y = -(-1)^2 - 2(-1) + 1 = -1 + 2 + 1 = 2 \quad x = -1 \quad (-1, 2)$$

REF: 061534ia

10 ANS:

$$\begin{aligned} (-2, 11). \quad x &= \frac{-b}{2a} = \frac{-(-8)}{2(-2)} = -2 \\ y &= -2(-2)^2 - 8(-2) + 3 = 11 \end{aligned}$$

REF: 080934ia