

Worksheet: Standard form, line of symmetry and vertex for quadratic equations

Name: _____ Date: _____

Mr. ChvatalPractice writing quadratic equations in standard form and identifying a , b and c .Remember, standard form is $y = ax^2 + bx + c$.

Sample #1: $y = -2x + x^2 - 8$

Sample #2: $y = -25 + x^2$

Answer: $y = x^2 - 2x - 8$

Answer: $y = x^2 - 25$

$a = 1, b = -2, c = -8$

$a = 1, b = 0, c = -25$

1. $y = x^2 + 3x + 11$

2. $y = x^2 - 7x - 11$

3. $y = 4x + x^2 - 9$

4. $y = 16 - x + 3x^2$

5. $y = x^2 - 9$

6. $y = 2x^2 + 5x$

7. $y = -3 - 4x^2$

8. $y = 6x^2$

9. $y = -x^2 - 8 + 6x$

10. $y = x - x^2$

For the following quadratic equations, identify a , b and c , determine whether the parabola opens up or down, and whether there is a minimum or a maximum.

Sample #1: $y = x^2 - 2x + 7$

Sample #2: $y = -x^2 + 8$

Answer: $a = 1, b = -2, c = 7$

Answer: $a = -1, b = 0, c = 8$

Opens up; minimum.

Opens down; maximum.

1. $y = x^2 + 3x + 12$

2. $y = 2x^2 - 3x - 1$

3. $y = -x^2 - 12x + 4$

4. $y = x^2 + 5x - 9$

5. $y = -7x^2 - 9x - 3$

6. $y = 5x - x^2 - 1$

7. $y = -9 + 5x^2$

8. $y = 3x^2$

9. $y = -10x^2 - 70 + 6x$

10. $y = 12x + 12x^2$

For the following quadratic equations, identify a , b and c , and then find the equation for the line of symmetry.

Sample #1: $y = x^2 + 6x - 5$

Sample #2: $y = -2x^2 - 5x + 7$

Answer: $a = 1, b = 6, c = -5$

Answer: $a = -2, b = -5, c = 7$

The line of symmetry:

$$x = \frac{-b}{2a}$$

$$x = -3$$

The line of symmetry:

$$x = \frac{-b}{2a}$$

$$x = -\frac{5}{4}$$

1. $y = x^2 + 4x + 12$

2. $y = x^2 + 10x - 3$

3. $y = x^2 - 12x + 4$

4. $y = 2x^2 + 8x - 5$

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

6. $y = -x^2 - 2x - 2$

7. $y = x^2 + 3x - 8$

8. $y = 4x^2 - 16$

9. $y = -8x^2$

10. $y = 2x^2 - 7x$

For the following quadratic equations, identify a , b and c , and then find the equation for the line of symmetry, the minimum/maximum, and the coordinates of the vertex.

Sample #1: $y = x^2 - 4x - 5$

Sample #2: $y = -x^2 - 8x + 1$

Answer: $a = 1, b = -4, c = -5$

Answer: $a = -1, b = -8, c = 1$

The line of symmetry:

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

$$x = 2$$

The minimum:

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

$$y = -9$$

The vertex:

$$(2, -9)$$

The line of symmetry:

$$x = \frac{-(-8)}{2(-1)}$$

$$x = -4$$

The maximum:

$$y = -(-4)^2 - 8(-4) + 1$$

$$y = 17$$

The vertex:

$$(-4, 17)$$

1. $y = x^2 - 6x + 2$

2. $y = x^2 - 2x + 7$

3. $y = -x^2 - 2x + 3$

4. $y = x^2 - 16$