Quadratics – Day 2 Name ________________________
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When given a quadratic function you can start by factoring to find the zeros.

Example 1: The first step to finding the roots of a quadratic function is to **factor the quadratic**.
*Remember it must be equal to zero!

$y = x^2 + 3x + 2 \quad \rightarrow \quad y = (x + 1)(x + 2)$

Once the quadratic is factored, the next step is to find the roots.
Roots are found when y = 0. Therefore we must set the two binomials equal to 0.

$$\begin{array}{rcl} (x + 1) = 0 & \text{and} & (x + 2) = 0 \\ \underline{\;\; -1 \quad -1} & & \underline{\;\; -2 \quad -2} \\ x = -1 & \text{and} & x = -2 \longrightarrow \end{array}$$

This allows us to find x when y is zero (our x-intercepts). These are our two roots.

We can write these roots as ordered pairs (-1, 0) and (-2, 0) or as a solution set {-2, -1}.

To find the vertex of a quadratic:

You can use the expression: $\frac{-b}{2a}$ to find the x value of the vertex .

*Remember the equation must be in the standard form, $y = Ax^2 + Bx + C$.

Example:

Find the vertex of the parabola $y = 3x^2 + 12x – 12$.

Here, a = 3 and b = 12. So, the x-coordinate of the vertex is: $\frac{-12}{2(3)} = \frac{-12}{6} = -2$

Substituting (x = -2) in the original equation to get the y-coordinate, we get:

$y = 3(–2)^2 + 12(–2) – 12$

$y = –24$

So, the vertex of the parabola is at (–2, –24).

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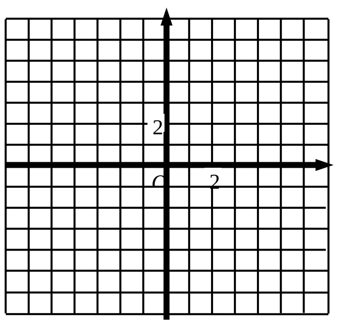
Find the solutions by factoring, sketch each parabola and identify the parts of the quadratic.

1. $x^2 - 5 = 4x$

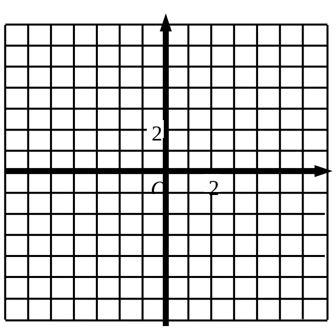


Solution Set: _________

Vertex __________Maximum or Minimum point? ______

Equation of the Line of Symmetry _______________

2. $x^2 - 1 = 0$

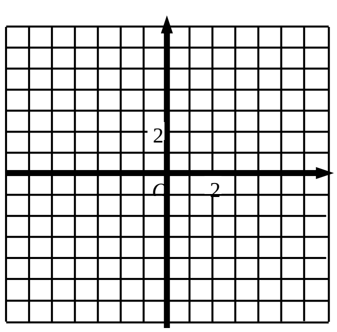


Solution Set: _________

Vertex __________Maximum or Minimum point? ______

Equation of the Line of Symmetry _______________

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



Solution Set: ___________

Vertex __________Maximum or Minimum point? ______

Equation of the Line of Symmetry _______________