Name: **Date:**

Unit 9, Day 6 Notes   **Period:**

Solving Quadratics Using the Zero-Product Property

When a quadratic equation is in factored form, we can use the *Zero-Product Property* to find the solutions.

Zero-Product Property

If $a \cdot b = 0$, then either $a = 0$ or $b = 0$.

Ex:

If $3x = 0$, solve for x.

x *must* equal zero.

We can use the **ZPP** to solve factored quadratics.

Ex:

Find the zeros $y = (x - 1)(x + 4)$

Step 1: Set the equation equal to zero.
Step 2: Write two new equations with the factors equal to zero.
Step 3: Solve each of the new equations. These are your x-intercepts/solutions/zeros/roots.
Step 4: Graph (or plug in) to solve.

Solve each:

$x - 1 = 0$	$x + 4 = 0$

The solutions of $y = (x - 1)(x + 4)$ are $x =$ and $x =$.

Graph $y = (x - 1)(x + 4)$ and check!

You Try:

Determine the roots of $y = (x+2)(x+4)$	Find the zeros of $y = -(x-2)(x-3)$	What are the solutions of $y = x(2x+3)$
Step 1:	Step 1:	Step 1:
Step 2:	Step 2:	Step 2:
Step 3:	Step 3:	Step 3:

Solving Quadratics by Factoring

When you are asked to solve a quadratic that isn't factored yet, then use the ZPP to find the solutions.

Ex: Solve $y = x^2 - 3x - 40$.

	Step 1: Factor the equation.
	Step 2: Set the equation equal to zero.
	Step 3: Set each factor equal to zero.
	Step 4: Solve the two new equations.
	Step 4: Graph to check.

You try:

Determine the roots of $y = x^2 + 6x + 8$	Find the zeros of $y = -x^2 + 5x - 6$	What are the solutions of $y = 4x^2 + 4x + 8$

Calculator check

| You can find solutions by **graphing** and finding the **zeros** on the **table.**
Use your calculator to find the solutions to:
$$x^2 - 7x + 10 = 0$$

1. Graph the equation.
  TABLE F5
  2ND GRAPH
2. Press _____.
3. Look for the values of x where y is zero. | |