Algebra I
Lesson 9.6 – Solving Quadratic Functions by Factoring
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As with all equations, we know that there are algebraic methods we can use to solve the equation. Using our factoring techniques from chapter 8, and the **Zero Product Property**, we can solve quadratic equations algebraically.

Vocabulary

Zero Product Property – If the product of two quantities equals zero, at least one of the quantities must equal zero. If $ab = 0, then\ a = 0\ or\ b = 0$.

$(\triangle)\ (\odot) = 0$ $\triangle = 0 \quad or \quad \odot = 0$ SO: $(\smiley)\times(\text{☀})\times(\heartsuit) = 0$ $\smiley = 0 \quad \text{☀} = 0 \quad \heartsuit = 0$	*Whatever the expressions are, if you have a product, you may set each expression equal to zero and solve.* *Yes!! This goes for products of 3, 4 or more expressions!*

After a quadratic equation is factored, there will be 2 quantities equal to zero, using the zero product property, the factors are set equal to zero and the solve for x. *Check your solutions by graphing the equation!*

$x^2 + x - 12 = 0$ $(x + 4)(x - 3) = 0$ $x + 4 = 0 \quad or \quad x - 3 = 0$ $x = -4 \quad or \quad x = 3$	1. Factor the quadratic equation 2. Set each factor equal to zero and solve 3. Solutions are the zeros.

Remember

You try: *(your equation must be in standard form)*

$$x^2 + 4x - 5 = 0 \qquad\qquad 30x = -9x^2 - 25 \qquad\qquad 3x^2 - 4x + 1 = 0$$

Application:

The height of a diver above the water during a dive can be modeled by $h = 16t^2 + 8t + 24$, where h is height in feet and t is time in seconds. Find the time it takes for the diver to reach the water. (When the diver hits the water what is the height???)