



Date:

Section: 6.1

Objective: Solving quadratics

Quadratic Equation: Any equation that can be written in the form $ax^2 + bx + c = 0$, where $a \neq 0$.

Zero Product Property: If the product of several factors is equal to zero, then at least one of the factors is equal to zero.

- The only way to end up with zero when you multiply is if one of the numbers being multiplied is zero.
- If a and b are real numbers and $a \cdot b = 0$, then $a = 0$ or $b = 0$ or both.

★ **This is only true if one side of the equation is zero.**

If $a \cdot b = 1$, it *does not mean* that $a = 1$ or $b = 1$. $(2)\left(\frac{1}{2}\right) = 1$, $\left(\frac{3}{4}\right)\left(\frac{4}{3}\right) = 1$, etc.

DON'T split up $(x+5)(x-3) = 1$ into $x+5 = 1$ and $x-3 = 1$. **That's wrong!**

Solving Quadratic Equations by Factoring:

1. Get a zero on one side of the equation.
2. Factor completely.
3. Set each factor *containing a variable* equal to 0.
4. Solve the resulting equations.

Examples: Solve each equation by factoring.

a) $(x-3)(x+5) = 0$

b) $3x(x+4) = 0$

c) $2(x+5)(3x-4) = 0$

d) $(x+7)^2 = 0$

e) $3x^2 = 0$

f) $x^2 - 8x = 0$

g) $x^2 + 7x + 6 = 0$

h) $x^2 - 4x = 12$

i) $4x^2 = 9$

j) $-x^2 - 10x = 25$

k) $3x^2 + 15x + 18 = 0$

l) $2x^2 = x$

m) $4x^2 + 5x - 6 = 0$

n) $2x^2 - 21x = 11$

o) $3x^2 - 15 = 4x$

p) $11x = -5x^2 - 2$