

**Day 1- Solve by Factoring**

General Steps:

1. Check to see if the polynomial has a greatest common factor.

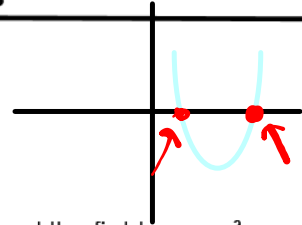
2. Set up two empty sets of parenthesis below the polynomial.

3. The first numbers must  $( \quad )( \quad )$  multiply together to equal the first term,  $ax^2$ .

4. The second numbers  $( \quad )( \quad )$  must multiply together to equal the last term  $c$ .

5. Multiply the outside terms and then the inside terms. When those terms are added together, they should equal the middle term,  $b$ .

6. Check your answer by multiplying the two binomials together.



$$y = ax^2 + bx + c$$

**Review of Factoring Types:**

Factoring A = 1	Difference of Two Squares
<p>Factor: <math>x^2 + 3x - 18</math></p> <p>no GCF</p> <p><math>(x - 3)(x + 6)</math></p> <p><math>6x - 3x = 3x</math></p> <p><math>(x - 3)(x + 6)</math></p> <p>1 · 18 2 · 9 3 · 6</p>	<p>Factor: <math>x^2 - 16</math></p> <p><math>(x + 4)(x - 4)</math></p> <p><math>-4x + 4x = 0x = 0</math></p> <p><math>(x + 4)(x - 4)</math></p> <p>1 4 9 16 25 ...</p>

Algebra 1	Solving Quadratic Equations	Notes
<p><b>Factoring A not 1</b>                      Factor: <math>2x^2 - 13x + 15</math></p> <p><math>2x \cdot x</math> (blue)  <math>1 \cdot 15</math>  <math>3 \cdot 5</math> (red)</p> <p><math>(2x - 3)(x - 5)</math></p> <p><math>-10x - 3x = -13x</math></p> <p><math>(2x - 3)(x - 5)</math> (highlighted)</p>	<p><b>Factoring by GCF</b>                      Factor: <math>x^2 - 6x</math></p> <p><math>x \cdot x</math> (red)</p> <p><math>x(x - 6)</math> (highlighted)</p>	
<p><b>Factoring with GCF &amp; A = 1</b>                      Factor: <math>3x^2 - 3x - 60</math></p> <p><math>3 \cdot 3 \cdot 3</math> (red)  <math>1 \cdot 2 \cdot 0</math>  <math>2 \cdot 10</math>  <math>4 \cdot 5</math> (red)</p> <p><math>3(x^2 - x - 20)</math></p> <p><math>3(x + 4)(x - 5)</math></p> <p><math>-5x + 4x = -x</math></p> <p><math>3(x + 4)(x - 5)</math> (highlighted)</p>	<p><b>Factoring with GCF and A not 1</b>                      Factor: <math>10x^2 - 22x + 4</math></p> <p><math>2 \cdot 2 \cdot 2</math> (red)</p> <p><math>2(5x^2 - 11x + 2)</math></p> <p><math>5x \cdot x</math> (blue)  <math>2 \cdot 1</math> (red)</p> <p><del><math>2(5x - 2)(x - 1)</math></del></p> <p><math>-5x - 2x = -7x</math></p> <p><math>2(5x - 1)(x - 2)</math></p> <p><math>-10x - x = -11x</math></p> <p><math>2(5x - 1)(x - 2)</math> (highlighted)</p>	

Practice with Solving Quadratic Equations by Factoring

1.  $y = x^2 - 14x + 48$

Factored Form: \_\_\_\_\_

Zeros: \_\_\_\_\_

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

$y = (x - 3)(x - 3)$

$0 = (x - 3)(x - 3)$

$x - 3 = 0$   
 $x = 3$

Factored Form:  $(x - 3)(x - 3) = 0$

Zeros:  $x = 3$

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

$0 = x^2 - 5x - 6$

$0 = (x - 6)(x + 1)$

$x - 6 = 0$   
 $x = 6$

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

Factored Form:  $0 = (x - 6)(x + 1)$

Zeros:  $x = 6, -1$

4.  $y = x^2 - 9$

$y = (x - 3)(x + 3)$

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

Factored Form: \_\_\_\_\_

Zeros: \_\_\_\_\_

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

$0 = x^2 + 2x + 1$

$0 = (x + 1)(x + 1)$

$x = -1$        $x = -1$

Factored Form:  $0 = (x + 1)(x + 1)$

Zeros:  $x = -1$

9.  $2x^2 - 6x = 0$

$2x(x - 3) = 0$

$\frac{2x}{2} = \frac{0}{2}$        $x - 3 = 0$   
 $x = 0$        $+3 +3$   
 $x = 3$

Factored Form:  $2x(x - 3) = 0$

Zeros:  $x = 0, 3$