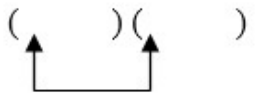
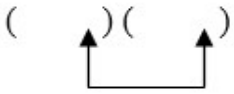
Day 1- Solve by Factoring

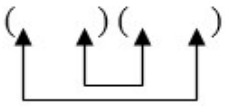
General Steps:

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  multiply together to equal the first term, $\boldsymbol{ax^2}$.

4. The second numbers  must multiply together to equal the last term $\boldsymbol{c}$.

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

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

Review of Factoring Types:

Factoring A = 1	**Difference of Two Squares**
Factor: $x^2 + 3x - 18$	*Factor:* $x^2 - 16$

Factoring A not 1	**Factoring by GCF**
Factor: $2x^2 - 13x + 15$	*Factor:* $x^2 - 6x$
Factoring with GCF & A = 1	**Factoring with GCF and A not 1**
Factor: $3x^2 - 3x - 60$	*Factor:* $10x^2 - 22x + 4$

Practice with Solving Quadratic Equations by Factoring

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

Factored Form: _____

Zeros: _____

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

Factored Form: _____

Zeros: _____

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

Factored Form: _____

Zeroes: _____

4. $y = x^2 - 9$

Factored Form: _____

Zeroes: _____

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

Factored Form: _____

Zeroes: _____

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

Factored Form: _____

Zeroes: _____

Day 2 - Solving by Finding Square Roots/Completing the Square

Solving by Finding Square Roots :

Steps for Solving Quadratics by Finding Square Roots

1. Add or Subtract any constants that are on the same side of x^2.
2. Multiply or Divide any constants from x^2 terms. "Get x^2 by itself"
3. Take square root of both sides and set equal to positive and negative roots (±).

Ex: $x^2 = 25$

$\sqrt{x^2} = \sqrt{25}$

$x = \pm 5$

$x = +5$ and $x = -5$

REMEMBER WHEN SOLVING FOR X YOU GET A _____ AND _____ ANSWER!

Solve the following for x:

1) $x^2 = 49$

2) $x^2 = 20$

3) $7x^2 - 6 = 57$

4) $10x^2 + 9 = 499$

5) $2x^2 + 8 = 170$

6) $x^2 = 0$

7) $\frac{1}{2}(x+8)^2 = 14$

8) $-2(x+3)^2 - 16 = -48$

9) $3(x-4)^2 + 7 = 67$

Solving by Completing the Square:

The Equation: $x^2 + 6x + 2 = 0$

STEP 1: move constant term to the other side) $x^2 + 6x + \_\_\_\_ = -2$

STEP 2: make the left hand side a perfect square trinomial by adding $\left(\frac{b}{2}\right)^2$ to **both** sides $x^2 + 6x + \boxed{9} = -2 + \boxed{9}$

STEP 3: factor the left side, simplify the right side $(x+3)^2 = 7$ (You've completed the square – time to solve!)

STEP 4: solve by finding square roots

$\sqrt{(x+3)^2} = \sqrt{7}$

$x + 3 = \sqrt{7} \quad and \quad x + 3 = -\sqrt{7}$

$x = -3 + \sqrt{7} \quad and \quad x = -3 - \sqrt{7}$

Solve for x.

1. $x^2 - 6x - 72 = 0$

X = _____

2. $x^2 + 80 = 18x$

X = _____

3. $x^2 - 14x - 59 = -20$

X = _____

4. $2x^2 - 36x + 10 = 0$

X = _____

Day 3 - Solving by Quadratic Formula

What method do you use when your equations are not factorable, but are in standard form, and a may not be 1 and b may not be even?

The Quadratic Formula

for equations in standard form: $y = ax^2 + bx + c$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

x represents the zeros and $b^2 - 4ac$ is the discriminant

For the quadratic equations below, use the quadratic formula to find the solutions. Write your answer in simplest radical form.

1) $4x^2 - 13x + 3 = 0$ a = ____ b = ____ c = _____

2) $9x^2 + 6x + 1 = 0$ a = ____ b = ____ c = _____

Discriminant: _____

Solutions: _____

Discriminant: _____

Zeros: _____

3) $6x^2 + 3 = 10x$ a = ____ b = ____ c = _____

4) $\frac{1}{2}x^2 + 6x + 13 = 0$ a = ____ b = ____ c = _____

Discriminant: _____

X = _____

Discriminant: _____

Roots: _____