Factoring Quadratics: 3 Methods

$$9x^{2}-81$$

$$\sqrt{9x^{2}}=3x \sqrt{81}=\mp 9$$

$$\left(3x+9\right)(3x-9)$$

$$x^{2}+8x+16$$

$$\sqrt{x^{2}}=x \sqrt{16}=\mp 4$$

$$2\*4\*x=8x$$

$$\left(x+4\right)(x+4)$$

$$(x+4)^{2}$$

$$x^{2}+ 5x+6$$

**6 = 1\*6, 2\*3, -1\*-6, -2\*-3**

**2+3 = 5**

**(x+2)(x+3)**

**Method 3: Difference of Two squares**

$$a^{2}-b^{2}=\left(a+b\right)\left(a-b\right)$$

1. **Check if the two terms are perfect squares**
2. **Check for subtraction**
3. **Write in factored form as the square roots of each term, added and subtracted.**

**Method 2: Factoring Perfect Square Trinomials**

$$x^{2}+ 2xy+ y^{2}= (x+y)^{2} $$

A perfect square is a number with a square root which is an integer or variable.

$$\sqrt{9}=\mp 3 \sqrt{225}=\mp 15 $$

$$ \sqrt{x^{2}}=x \sqrt{4x^{6}}=2x^{3}$$

1. **Check if the first and third terms are perfect squares.**
2. **Check to see if the second term is two times the square roots found in step 1**
3. **Write in factored form as the square root of the first and last terms.**

Note: Watch for negative numbers, the square roots can be negative

**Method 1: In the form ax2 + bx + c**

1. **Determine the factors of c**
	1. **Both positive and negative**
2. **Determine the set of factors that add up to the b term.**
3. **Rewrite in factored form using factors.**

Note: If there are no factors of c that add up to b, the factors are decimals.