***Factoring Polynomials***

**Is it a binomial or Trinomial?**

 **Binomial Trinomial**

Is there a GCF?

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 **Yes No Yes No**

**Factor out GCF**

Example: $3x^{2}-12x=3x(x-4)$

Example: $4x^{3}-36x=4x(x^{2}-9)$

**Is it DOTS?**

Ex: $x^{2}-49$

or $36a^{2}-49b^{2}$

Is….

$$a=1 or a>1?$$

**Factor out GCF**

Example

$$3x^{2}-18x+15=3(x^{2}-6x+5)$$

or

$$2x^{2}+8x-14=2(x^{2}+4x-7)$$

 **Yes No**

**Factor using conjugate pairs!**

Ex: $x^{2}-49=\left(x+7\right)\left(x-7\right)$

Ex: $36a^{2}-49b^{2}=(6a+7b)(6a-7b)$

Example $x^{2}+25$

or $3x^{2}-5$

**Prime! Can’t factor!**

**Quadratic Formula!**

$ a=1$$ a>1$

**Factor using trial and error!**

Example

$$6x^{2}-11x-10$$

$$=(3x+2)(2x-5)$$

***or Quadratic Formula!***

**Factor into product of two binomials**

Example

$$x^{2}+2x-8=(x+4)(x-2)$$

***or Quadratic Formula!***

Is the remaining factor DOTS?

 **Yes No**

Is the remaining trinomial able to be factored?

**No further factoring can be done!**

Example

$$3x^{2}-12x=3x(x-4)$$

**Factor completely!**

Example

$$4x^{3}-36x=4x(x^{2}-9)$$

$$ =4x(x+3)(x-3)$$

 **Yes No**

**No more traditional factoring can be done!**

$$2x^{2}+8x-14=2(x^{2}+4x-7)$$

 ***Quadratic Formula!***

**Factor Completely!**

$$3x^{2}-18x+15=3(x^{2}-6x+5)$$

$$ =3(x-5)(x-1)$$