

# Factoring Video Lecture

## Sections 6.1 - 6.5

### Course Learning Objective:

**Simplify polynomial expressions. (Review from Math 840)**

### Weekly Learning Objectives:

- 1) Factor out the greatest common factor from a polynomial.**
- 2) Factor a polynomial by grouping.**
- 3) Factor trinomials of the form  $x^2+bx+c$ .**
- 4) Factor out the greatest common factor and then factor a trinomial of the form  $x^2+bx+c$ .**
- 5) Factor trinomials of the form  $ax^2+bx+c$ , where  $a$  is not 1.**
- 6) Factor out a GCF before factoring a trinomial of the form  $ax^2+bx+c$ .**
- 7) Factor perfect square trinomials.**
- 8) Factor the difference of two squares.**
- 9) Factor the sum or difference of two cubes.**
- 10) Factor expressions with variable exponents.**

## Factoring

Greatest Common Factor: Always check for a GCF first!

$$125a^3z^5 + 60a^4z^4 - 85a^5z^2 =$$

$$19p^2y - 38p^2y^3 =$$

$$k^{-2} + 2k^{-4} =$$

$$3p(1-4p) - 2q(1-4p) =$$

Grouping: Try when there are 4 (or any even number of) terms

$$m^2 + 2m + mn + 2n =$$

$$6 - 3x - 2y + xy =$$

$$4b^3 + a^2b - 4a - ab^4 =$$

**Reverse FOIL: Try when there are 3 terms**

**1) If the leading coefficient is one:**

**Find two numbers that multiply to the last term and add to the middle coefficient**

$$x^2 + 7x + 12 =$$

$$x^2 - 3x - 28 =$$

**2) If the leading coefficient is not one:**

**Trial and Error method or Reverse FOIL**

$$6x^2 - 5x - 14 =$$

$$32z^5 - 20z^4 - 12z^3 =$$

Difference of Squares: Try if there are 2 terms (it must be subtraction!)

$$\square^2 - \Delta^2 = (\square + \Delta)(\square - \Delta)$$

$$4x^2 - 9y^2 =$$

$$x^4 - 1 =$$

Sum or Difference of Cubes: Try if there are 2 terms

$$\square^3 + \Delta^3 = (\square + \Delta)(\square^2 - \square\Delta + \Delta^2)$$

$$\square^3 - \Delta^3 = (\square - \Delta)(\square^2 + \square\Delta + \Delta^2)$$

$$8x^3 - 1 =$$

$$125x^3 - 27y^3 =$$

$$5x^4 - 80 =$$

$$4x^2 + 16 =$$

$$12a^2 + 17ab + 6b^2 =$$

$$3x^6 - 14x^3 + 8 =$$

$$K^{2y} + 4K^y - 5 =$$

$$30y^{7a} - 26y^{6a} - 40y^{5a} =$$

$$(h+k)^2 - 9 =$$

$$100m^{28} - 81 =$$

$$27x^5y^4 - 216x^2y =$$

$$4x^2 + 4x + 1 - y^2 =$$