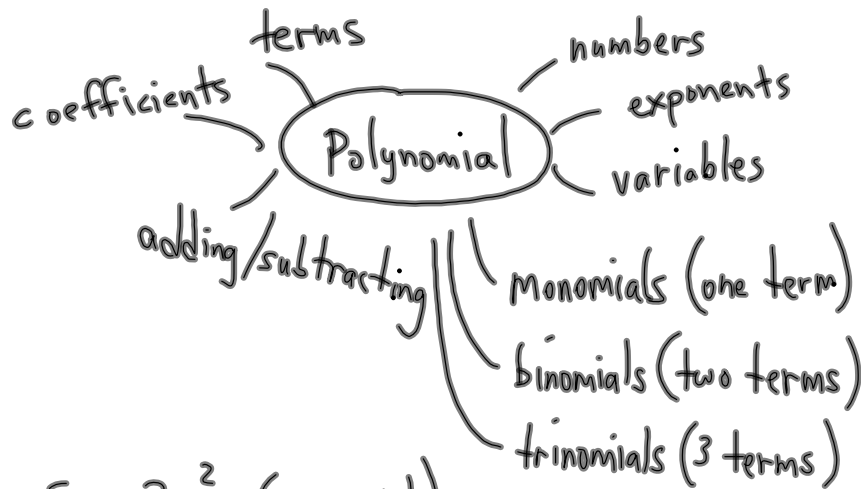


Unit 4: Factors and Products3.3: Common factors of a polynomial

Ex:  $3x^2$  (monomial)

$2x + 1$  (binomial)

$3x^2 - 2x - 5$  (trinomial)

Multiplying a monomial by a polynomial

Ex:  $3x(2x + 1)$  (distributive property)

$$6x^2 + 3x$$

Ex ②  $2x(5x^2 + 2x - 3)$

$$10x^3 + 4x^2 - 6x$$

Ex ③  $(2x^2)(5x) = 10x^3$

Ex ④  $3xy(2x + 4xy - 5y)$

$$6x^2y + 12x^2y^2 - 15xy^2$$

Multiplying a Binomial by a Binomial

Ex:  $(2x+1)(3x-4)$  Distributive Property  
twice

$$2x(3x-4) + 1(3x-4)$$

$$6x^2 - 8x + 3x - 4$$

like terms

$$6x^2 - 5x - 4$$

Ex(2)  $(5x-3)(4x-7)$

$$5x(4x-7) - 3(4x-7)$$

$$20x^2 - 35x - 12x + 21$$

$$20x^2 - 47x + 21$$

Ex(3)  $(2x+3)(2x-3)$  ← conjugates

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

$$4x^2 - 6x + 6x - 9$$

$$4x^2 + 0x - 9$$

$$4x^2 - 9$$

Difference of Squares

Ex(4)  $(4x+3)^2$

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

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

$$= 16x^2 + 12x + 12x + 9$$

$$= 16x^2 + 24x + 9$$

Ex(5):  $(3x-5)^2$

$$(3x-5)(3x-5)$$

$$9x^2 - 15x - 15x + 25$$

$$9x^2 - 30x + 25$$

Multiplying a binomial by a trinomial

$$\underline{\text{Ex:}} (3x+2)(x^2-2x+4)$$

$$3x(x^2-2x+4) + 2(x^2-2x+4)$$

$$3x^3 - 6x^2 + 12x + 2x^2 - 4x + 8$$

$$3x^3 - 4x^2 + 8x + 8$$

$$\underline{\text{Ex:}} (x-2)(x^2+2x+4)$$

$$x(x^2+2x+4) - 2(x^2+2x+4)$$

$$x^3 + 2x^2 + 4x - 2x^2 - 4x - 8$$

$$x^3 - 8$$

Multiplying a trinomial by a trinomial

$$(x^2+3x-1)(2x^2-x+4)$$

$$x^2(2x^2-x+4) + 3x(2x^2-x+4) - 1(2x^2-x+4)$$

$$2x^4 - x^3 + 4x^2 + 6x^3 - 3x^2 + 12x - 2x^2 + x - 4$$

$$2x^4 + 5x^3 - x^2 + 13x - 4$$

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Multiplying : A mixture

$$\underline{\text{Ex:}} \quad \underbrace{(2x-1)(x+3)} + \underbrace{(x-5)(3x+2)}$$

$$5x^2 - 8x - 13$$

$$\underline{\text{Ex(2)}} : \quad 3(x+2)(5x-2) + 2x(x+3)$$

$$\quad \quad \quad \underbrace{(5x^2 - 2x + 10x - 4)} + 2x^2 + 6x$$

$$\quad \quad \quad \overbrace{3(5x^2 + 8x - 4)} + 2x^2 + 6x$$

$$15x^2 + 24x - 12 + 2x^2 + 6x$$

$$17x^2 + 30x - 12$$