Unit 5: Polynomials and polynomials equations

(Chapter 5, page 204)

Important factors in this unit:

Common factor, formulas, MATH, grouping

Squares:

$$(A + B)(A\text{-}B) = A^2\text{-}B^2$$

Cubes (SOAP):

$$A^3 - B^3 = (A\text{-}B)\,(A^2 + AB + B^2)$$

$$A^3 + B^3 = (A + B)\,(A^2\text{-}AB + B^2)$$

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☐	Definitions -- Polynomial in x : $a_n x^n + a_{n-1}x^{n-1} + \cdots + a_1 x + a_0$ -- monomial, binomial, trinomial ---- Example: $5x^3 - 2x + 7$ <u>Terms:</u> _____ , _____ , _____ <u>Coefficients:</u> _____ , _____ , _____ <u>Degree of term:</u> _____ , _____ , _____ <u>Degree of Polynomial:</u> _____ (degree of highest term) <u>Like terms:</u> Same variables raised to the same power. $2x^3y^6 + 3y^6x^3 = 5x^3y^6$	Page 206
☐	Addition and subtraction of polynomials -- Combine like terms Example: $(13x^3y^2 + 3x^2y - 5y) + (x^3y + 4x^2y - 3xy + 3y) =$	Page 210
☐	Multiplication (product) of polynomials Multiply everything! (FOIL is a special case for binomials) $(2y^2 + y)(5x^3 - 2x + 7) =$	Page 214

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☐	**Factoring** Write an expression as a product.	
☐	**Common factoring formulas** (you need to know by heart, and use fluently!) Give example to each below. $(A+B)^2 = A^2 + 2AB + B^2$ | $(A-B)^2 = A^2 - 2AB + B^2$ $(A+B)^3 = A^3 + 3A^2B + 3AB^2 + B^3$ | $(A-B)^3 = A^3 - 3A^2B + 3AB^2 - B^3$ $(A+B)(A-B) = A^2 - B^2$ $A^3 + B^3 = (A+B)(A^2 - AB + B^2)$ (SOAP) | $A^3 - B^3 = (A-B)(A^2 + AB + B^2)$ (SOAP)	Page 215 and onward
☐	Factoring strategy: 1. Common factor. 2. Two terms: Try factoring as difference of two squares, or difference or sum of cubes. Three terms: Is it trinomial square? MATH method. More than three terms: Try grouping. 3. Keep factoring. Make sure that each remaining factor is prime.	Page 229

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☐	**Solving equations by factoring** Using the zero products principle ---- Example: Solve $$x^2 - 3x - 28 = 0$$	
☐	Good trick to remember: $$\left(x + \frac{1}{x}\right)^2 = \mathrm{x}^2 + 2 + \frac{1}{\mathrm{x}^2}$$	

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