Foundations of Math 2
Unit 3 Study Guide
Polynomials and Factoring

Key Terms:

- Binomial
- Degree of a Monomial
- Perfect-Square Trinomial
- Monomial
- Degree of a Polynomial
- Standard Form of a Polynomial
- Trinomial
- Difference of Two Squares
- Polynomial
- Factoring by Grouping

Material by Subject:

3.1. Add/Subtract Polynomials

- Understand and be able to use the terms monomial, binomial, trinomial, and polynomial.
- Be able to determine the degree of both a monomial and a polynomial.
- Be able to put a polynomial in standard form.
- Be able to classify polynomials.
- Monomials can only be added into a single term if they are like terms (same variable and exponent)
- Be able to add polynomials (combine like terms)
- Be able to subtract polynomials (distribute negative, then combine like terms)

3.2. Multiply/Factoring Polynomials

- Be able to multiply a monomial by a trinomial via distribution.
- Understand how to find the greatest common factor (GCF) and be able to factor it out of a polynomial.
- Be able to apply multiplying and GCF to real-world situations (word problems).

3.3. Multiplying Binomials and Special Cases

- Be able to use the distributive property to multiply two binomials together.
- Be able to use a table to multiply two binomials.
- Understand what FOIL stands for and be able to use it to multiply two binomials.
- Be able to apply the multiplication of binomials to real-world situations (word problems).
- Understand how to use vertical multiplication to multiply a trinomial and a binomial.
- Be able to use the shortcut to square a binomial: $(a+b)^2 = a^2 + 2ab + b^2$ or $(a-b)^2 = a^2 - 2ab + b^2$
- Be able to multiply the sum of two monomials by their difference: $(a+b)(a-b) = a^2 - b^2$
- Be able to apply the special cases to real-world situations (world problems)

3.4. Factoring $x^2 + bx + c$

- Understand how the signs of b and c in combination will affect the factors of a quadratic expression.
- Remember to put the quadratic expression in standard form.
- Be able to use the reverse FOIL method of factoring.
- Be able to apply factoring to real-world situations (word problems).

3.5. Factoring $ax^2 + bx + c$

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- Remember to multiply *ac* if |a| > 1 when factoring a quadratic expression.
- Be able to factor *ac* to find the values that will add up to b before factoring
- Be able to use reverse FOIL to factor these quadratic expressions.
- Remember to factor out the GCF before factoring the polynomial using reverse FOIL.
- Be able to apply factoring to real-world situations (word problems).

3.6. Factoring Special Cases

- Recognize a perfect square trinomial
- Be able to use the relationships $(a+b)^2 = a^2 + 2ab + b^2$ and $(a-b)^2 = a^2 - 2ab + b^2$ to factor a perfect square trinomial.
- Recognize the difference of two squares.
- Be able to factor the difference of two squares using the relationship $(a+b)(a-b) = a^2 - b^2$
- Be able to apply factoring to real-world situations (word problems).

3.7. Factoring by Grouping

- Be able to factor a cubic function ($y = ax^3 + bx^2 + cx + d$) using the grouping method.
- Taking it one step at a time, be able to factor a polynomial using multiple kinds of factoring (GCF, reverse FOIL, grouping and/or special cases).
- Be able to apply factoring to real-world situations (word problems).