Algebra 2

4-02 Factor and Solve Polynomial Equations (4.4)

How to Factor

1. **Greatest Common Factor**
   - Comes from the _____ property
   - If the _____ number or variable is in each of the terms, you can bring the number to the _____ times everything that is left.

     $3x^2y + 6xy - 9xy^2$

   - Look for this _____!
2. **Check to see how many terms**
   a. *Two terms (formulas)*
      - Difference of Squares: $a^2 - b^2 = (a - b)(a + b)$

        $9x^2 - y^4$

      - Sum of Two Cubes: $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$

        $8x^3 + 27$

      - Difference of Two Cubes: $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$

        $y^3 - 8$

   b. *Three terms (General Trinomials → $ax^2 + bx + c$)*
      i. Write two sets of parentheses ( )( )
      ii. Guess and Check
      iii. The Firsts multiply to make ax^2
      iv. The Lasts multiply to make c
      v. The Outers + Inners make bx

      $x^2 + 7x + 10$ $6x^2 - 7x - 20$

   c. *Four terms (Grouping)*
      i. Group the terms into sets of two so that you can factor a common factor out of each set
      ii. Then factor the factored sets (Factor twice)

$b^3 - 3b^2 - 4b + 12$

3. **Try factoring more!**

$a^2x - b^2x + a^2y - b^2y$

$3a^2z - 27z$

$n^4 - 81$

Solving Equations by Factoring

1. Make _____
2. _____
3. Make each factor _____ because if one factor is zero, 0 time anything = 0

$2x^5 = 18x$

180 #1, 5, 9, 13, 17, 21, 25, 29, 33, 49, 53, 188 #1, 3, 5, 7, Mixed Review = 20