Factoring Polynomials
Worksheet to Accompany Videotape #4

To factor an algebraic expression means to write it as a product.

Strategies or Categories of factoring:

1. Removing a common factor:
   a. 5x + 15 =
   b. 3x^3 - 6x^2 - 12x =
   c. 14a^2bc - 7a^3b^3c^2 + 21a^2b^2c =
   d. (p + q)(x + 2) + (p + q)(x + 3) =

2. Factoring trinomials:
   a. x^2 + 5x + 4 =
   b. x^2 - 2x - 8 =
   c. 2x^2 + 11x + 12 =
   d. 12x^2 - 17x - 5 =

   a. x^2 - 4 =
   b. 9x^2 - 16 =
   c. 49 - y^2 =

4. Sum of two cubes: \( A^3 + B^3 = (A + B)(A^2 - AB + B^2) \)
   a. x^3 + y^3 =
   b. b^3 + 27 =
   c. 64 + a^3 =
5. Difference of two cubes:

\[ A^3 - B^3 = (A - B)(A^2 + AB + B^2) \]

a. \( x^3 - 8 = \)

b. \( 125x^3 - 1 = \)

c. \( 64a^3 - b^3 = \)

6. Sometimes use a combination of the above:

a. \( x^4 - x^2 = \)

b. \( x^5 - 8x^3 + 16x = \)

c. \( x^4 - 27x = \)

7. Factoring by grouping

a. \( ax^2 + ay + bx^2 + by = \)

b. \( px + py + qx + qy = \)

c. \( 3x^3 + 2x^2 - 12x - 8 = \)

d. \( x^2 - 4x + 4 - y^2 = \)