Pre Calculus 30S

Name: _____ Date: _____

Chapter 7 **Activate Prior Learning: 7.1 a**
Factoring Polynomials

Polynomials may be factored using a variety of techniques.

- Removing a common factor:

  The trinomial $12x^3 - 6x^2 + 3x$ has a common factor $3x$.

  So, $12x^3 - 6x^2 + 3x = 3x(4x^2 - 2x + 1)$

- Factoring using logical reasoning:

  To factor $x^2 + 2x - 15$, since x^2 has coefficient 1, look for 2 factors that have a sum of 2 and a product of –15. The factors are: 5 and –3

  So, $x^2 + 2x - 15 = (x + 5)(x - 3)$

- Factoring by decomposition:

  To factor $3x^2 + 17x + 10$, look for 2 factors that have a sum of 17 and a product of $3 \cdot 10 = 30$. The factors are: 2 and 15

  So, write $3x^2 + 17x + 10$ as $3x^2 + 2x + 15x + 10$.

  Remove a common factor from pairs of terms:

  $3x^2 + 2x + 15x + 10 = x(3x + 2) + 5(3x + 2)$ Remove a common binomial.

  $= (x + 5)(3x + 2)$

- Recognizing the form of the polynomial:

  Difference of squares: $a^2 - b^2 = (a - b)(a + b)$

  Perfect square trinomial: $a^2 + 2ab + b^2 = (a + b)^2$

  To factor $25x^2 - 49y^2$, write each term as a perfect square:

  $25x^2 - 49y^2 = (5x)^2 - (7y)^2$

  $= (5x - 7y)(5x + 7y)$

Check Your Understanding

1. Factor.

a) $x^5 + 2x^3 + 3x^2$ **b)** $-6 + 12x + 9x^2$ **c)** $24x + 30x^2 - 6x^4$

2. Factor.

a) $x^2 + 3x - 28$ **b)** $3v^2 - 7v + 4$ **c)** $2c^2 - 11c + 12$

3. Factor.

a) $x^2 - 64$ **b)** $8x^2 - 72y^2$ **c)** $2v^3 + 4v^2 - 30v$