

# Algebra 1

Chapter 8  
Section 8-6

## Factoring Polynomials

**FACTOR**

$$x^2 - 3x - 130$$

$$(x + 10)(x - 13)$$

$$x^2 + 16x + 63$$

$$(x + 7)(x + 9)$$

# Factor by Grouping

FACTOR:

$$3x^3 + 6x^2 + 5x + 10$$

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

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

# Factor by Grouping

## Examples

$$12x^5 + 8x^3 + 9x^2 + 6$$

$$xy + 5y - 3x - 15$$

$$4x^3(3x^2 + 2) + 3(3x^2 + 2)$$

$$y(x + 5) - 3(x + 5)$$

$$(3x^2 + 2)(4x^3 + 3)$$

$$(x+ 5)( y - 3)$$

# Factoring Polynomials

$$\text{Form: } ax^2 + bx + c$$

FACTOR:

$$ax^2 + bx + c$$
$$5x^2 + 13x + 6$$



$$5x^2 + 10x + 3x + 6$$

Multiply (a) times (c)  $5 \cdot 6 = 30$

Need two numbers that multiply to a·c  
and add to b

Multiply to 30 and add to 13  
(breaks b apart)

Use 10 and 3 to break 13 apart

# Factoring Polynomials

$$\text{Form: } ax^2 + bx + c$$

FACTOR:

$$5x^2 + 10x + 3x + 6$$

Factor by grouping

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

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

# Factor by Grouping

$$10x^2 + x - 3$$

$$10x^2 - 5x + 6x - 3$$

$$5x(2x - 1) + 3(2x - 1)$$

$$(2x - 1)(5x + 3)$$

$$11x^2 - 25x + 6$$

$$11x^2 - 22x - 3x + 6$$

$$11x(x - 2) - 3(x - 2)$$

$$(x - 2)(11x - 3)$$