

## Factoring Review

Factor – to rewrite an expression as a product.

There are five factoring techniques that are used in this course:

- 1) Common
  - 2) Difference of Squares
  - 3) Simple Trinomial
  - 4) Complex Trinomial (also called Product/Sum or Decomposition)
  - 5) Grouping (New)
- ← tomorrow*

### Common Factoring

Factor the following expressions:

a)  $3x + 9$   
 $= 3(x + 3)$

b)  $5x^2y + 10xy^2 - 20x^2y^2$   
 $= 5xy(x + 2y - 4xy)$

c)  $4x^2y - 8xy^2 - 1$   
 $= \text{can't factor}$

d)  $12x^3 + 16x^2 - 24xy$   
 $= 4x(3x^2 + 4x - 6y)$

### Difference of Squares

Factor the following expressions:

a)  $x^2 - 9$   
 $= (x - 3)(x + 3)$   
or

$(x + 3)(x - 3)$

c)  $w^2 + 81$   
 $\rightarrow \text{can't factor}$

b)  $16x^2 - 25y^2$   
 $= (4x - 5y)(4x + 5y)$

d)  $(x+3)^2 - (x-6)^2$   
 $= [(x+3) - (x-6)][(x+3) + (x-6)]$   
 $= [x+3 - x+6][2x-3]$   
 $= 9(2x-3)$

## Simple Trinomial Factoring

Factor the following expressions:

$$\begin{aligned} \text{a) } x^2 - 5x - 24 &= (x - 8)(x + 3) \end{aligned}$$

*Handwritten notes: 24, 1; 12, 2; 8, 3; 6, 4*

$$\text{b) } x^2 + 8x + 12 = (x + 6)(x + 2)$$

$$\begin{aligned} \text{c) } 2x^2 + 4x - 30 &= 2(x^2 + 2x - 15) \\ &= 2(x + 5)(x - 3) \end{aligned}$$

$$\begin{aligned} \text{d) } x^2 + 2x + 0 &= (x + 0)(x + 2) \\ &= x(x + 2) \end{aligned}$$

## Grouping

Factor the following expressions:

$$\begin{aligned} \text{a) } x^3 - 2x^2 + 3x - 6 &= x^2(x - 2) + 3(x - 2) \\ &= (x^2 + 3)(x - 2) \end{aligned}$$

$$\begin{aligned} \text{b) } ac - ad + bc - bd &= a(c - d) + b(c - d) \\ &= (a + b)(c - d) \end{aligned}$$

$$\begin{aligned} \text{c) } x^2 - 2x - 4y^2 + 1 &= (x^2 - 2x + 1) - 4y^2 \\ &= (x - 1)(x - 1) - 4y^2 \\ &= (x - 1)^2 - 4y^2 \\ &= [(x - 1) - 2y][(x - 1) + 2y] \\ &= [x - 1 - 2y][x - 1 + 2y] \end{aligned}$$

*Handwritten notes: (x-1) with arrow pointing to (x-1)^2; 2y with arrow pointing to 4y^2*