

# Factoring Technique #4

THE QUADRATIC FORMULA

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Solve using the quadratic formula.

$$3x^2 - 7x + 2 = 0$$

$$a = 3, b = -7, c = 2$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-7) \pm \sqrt{(-7)^2 - 4(3)(2)}}{2(3)}$$

$$x = \frac{7 \pm \sqrt{49 - 24}}{6}$$

$$x = \frac{7 \pm \sqrt{25}}{6}$$

$$x = \frac{7 \pm 5}{6}$$

$$x = \frac{12}{6} \quad x = \frac{2}{6}$$

$$x = 2, \frac{1}{3}$$

## Factoring Technique #5

Factoring By Grouping  
for polynomials  
with 4 or more terms

# Factoring By Grouping



1. Group the first set of terms and last set of terms with parentheses.
2. Factor out the GCF from each group so that both sets of parentheses contain the same factors.
3. Factor out the GCF again (the GCF is the factor from step 2).

Example 1:

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

Step 1: Group

$$= (b^3 - 3b^2) + (4b - 12)$$

Step 2: Factor out GCF from each group

$$= b^2(b - 3) + 4(b - 3)$$

Step 3: Factor out GCF

again

$$= (b - 3)(b^2 + 4)$$

Example 2:  $2x^3 - 16x^2 - 8x + 64$

$$= 2(x^3 - 8x^2 - 4x + 32)$$

$$= 2((x^3 - 8x^2) + (-4x + 32))$$

$$= 2(x^2(x - 8) + -4(x - 8))$$

$$= 2((x - 8)(x^2 - 4))$$

$$= 2((x - 8)(x - 2)(x + 2))$$

Try these on your own:

1.  $x^2 - 5x - 6$

2.  $3x^2 + 11x - 20$

3.  $x^3 + 216$

4.  $8x^3 - 8$

5.  $3x^3 - 6x^2 - 24x$

## Answers:

1.  $(x - 6)(x + 1)$

2.  $(3x - 4)(x + 5)$

3.  $(x + 6)(x^2 - 6x + 36)$

4.  $8(x - 1)(x^2 + x + 1)$

5.  $3x(x - 4)(x + 2)$