

## Lesson 10-5 (pp. 536-540)

## Factoring to Solve Quadratic Equations

<b>Lesson Objective</b> ▼ Solve quadratic equations by factoring	<b>NAEP 2005 Strand: Algebra</b> <b>Topic: Equations and Inequalities</b> <b>Local Standards:</b> _____
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### Key Concepts

**Zero-Product Property**  
 For every real number  $a$  and  $b$ , if  $ab = 0$ , then  $a = \boxed{0}$  or  $b = \boxed{0}$ .  
**Example** If  $(x + 3)(x + 2) = 0$ , then  $x + 3 = 0$  or  $x + 2 = 0$ .

### Examples

- 1 Using the Zero-Product Property Solve  $(2x + 3)(x - 4) = 0$  by using the Zero-Product Property.

$(2x + 3)(x - 4) = 0$   
 $2x + 3 = 0$  or  $x - 4 = 0$  Use the Zero-Product Property.  
 $\frac{2x}{2} = \frac{-3}{2}$  or  $x = 4$  Solve for  $x$ .  
 $x = \frac{-3}{2}$  or  $x = 4$

*Handwritten:*  $2x + 3 = 0$   
 $x = \frac{-3}{2}$  or  $4$

**Check** Substitute  $\frac{-3}{2}$  for  $x$ . Substitute  $4$  for  $x$ .  
 $(2x + 3)(x - 4) = 0$   $(2x + 3)(x - 4) = 0$   
 $[2(\frac{-3}{2}) + 3](\frac{-3}{2} - 4) \stackrel{?}{=} 0$   $[2(4) + 3](4 - 4) \stackrel{?}{=} 0$   
 $(0)(-5\frac{1}{2}) = 0 \checkmark$   $(11)(0) = 0 \checkmark$

- 2 Solving by Factoring Solve  $x^2 + x - 42 = 0$  by factoring.

$x^2 + x - 42 = 0$   $(x + 7)(x - 6) = 0$   $x = -7$  or  $6$   
 $(x + \boxed{7})(x - \boxed{6}) = 0$  Factor  $x^2 + x - 42$ .  
 $x + \boxed{7} = 0$  or  $x - \boxed{6} = 0$  Use the Zero-Product Property.  
 $x = \boxed{-7}$  or  $x = \boxed{6}$  Solve for  $x$ .

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