

Guiding Question - Can you use your knowledge of factoring to solve quadratic equations?

p. 60-61 Solving Equations by Factoring

Sect. 4.4

Warm-up

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Factor the following  $4x^2 - 36$

$$4(x^2 - 9)$$

$$4(x-3)(x+3)$$

Factors: \_\_\_\_\_

We can USE the ZERO PRODUCT PROPERTY to solve equations.

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If  $(a)(b) = 0$ , then either  $a = 0$  or  $b = 0$

Ex.) Solve the quadratic equation

$$x^2 - 4x - 35 = 10$$

$$\quad -10 \quad -10$$

$$x^2 - 4x - 45 = 0$$

$$(x-9)(x+5) = 0$$

$$x-9=0$$

$$x+5=0$$

$$x=9 \text{ or } x=-5$$

$$\text{Solutions: } \{-5, 9\}$$

1) Set = 0

2) Factor

3) Set each fact = 0

4) Solve

Practice! Solve the equation for x.

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1)  $(3x - 1)(2x + 1) = 0$       2)  $2x(x + 8)(5x - 4) = 0$

$$\begin{array}{r} 3x - 1 = 0 \text{ or } 2x + 1 = 0 \\ \hline +1 \quad +1 \qquad \qquad -1 \quad -1 \end{array}$$

$$\frac{3x = 1}{3 \quad 3} \quad \text{or} \quad \frac{2x = -1}{2 \quad 2}$$

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

$$x = -\frac{1}{2}$$

$$x = \left\{ -\frac{1}{2}, \frac{1}{3} \right\}$$

$$2x = 0$$

$$x + 8 = 0$$

$$\begin{array}{r} 5x - 4 = 0 \\ \hline +4 \quad -4 \\ 5x = 4 \end{array}$$

$$x = \left\{ 0, -8, \frac{4}{5} \right\}$$

More Practice. Solve the equation for x.

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What factoring skill do I need to recall?

3)  $0 = 12x^2 - 3x$

$$0 = 3x(4x - 1)$$

$$3x = 0 \text{ or } 4x - 1 = 0$$

$$\begin{array}{r} x = 0 \text{ or } \frac{+1 \quad +1}{4x = 1} \\ x = \frac{1}{4} \end{array}$$

4)  $10x^2 - 15x - 6 = -6$

$$\frac{\quad \quad \quad +6 \quad +6}{\quad \quad \quad}$$

$$10x^2 - 15x = 0$$

$$5x(2x - 3) = 0$$

$$5x = 0 \text{ or } 2x - 3 = 0$$

$$x = 0 \text{ or } x = \frac{3}{2}$$

More Practice. Solve the equation for x.

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What factoring skill do I need to recall?

5)  $0 = 36x^2 - 1$

$$0 = (\cancel{6x+1})(6x-1)$$

$$6x+1=0 \quad \text{or} \quad 6x-1=0$$

$$6x=-1$$

$$6x=1$$

$$x=-\frac{1}{6}$$

or

$$x=\frac{1}{6}$$

$$x = \left\{ -\frac{1}{6}, \frac{1}{6} \right\}$$

More Practice. Solve the equation for x.

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What factoring skill do I need to recall?

6)  $6x^2 + 18 = -21x$

$$+21x \quad +21x$$

$$6x^2 + 21x + 18 = 0$$

$$3(x^2 + 7x + 6) = 0$$

<del>3x</del>	<del>7</del>	<del>4x</del>	2x	x	2
	2x <sup>2</sup>	4x			
3	3x	6			

$$3(2x+3)(x+2) = 0$$

$$2x+3=0 \quad \text{or} \quad x+2=0$$

$$\frac{-3 \quad -3}{2x = -3}$$

$$x = -\frac{3}{2}$$

$$\text{or} \quad x = -2$$

Just one more...

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7)  $2x^2 - 28x = -90$

*Guiding Question - Can you use your knowledge of factoring to solve quadratic equations?*

Homework - Solving Quadratics by Factoring  
(#1-13 ODDs only)