Name _____ Class _____ Date _____

Reteaching 9-6

Completing the Square

OBJECTIVE: Solving quadratic equations by completing the square

MATERIALS: None

Remember that to complete the square, the coefficient of the squared term is 1 and the constant term is moved to the right side of the equation.

Example

Solve by completing the square: $2x^2 - 16x - 40 = 0$

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$x^2 - 8x - 20 = 0$	**Divide each side by 2.**
$x^2 - 8x = 20$	**Add 20 to each side.**
$x^2 - 8x + 16 = 20 + 16$	**Take $\frac{1}{2}$ the coefficient of x, square it, and add to both sides.**
$(x - 4)^2 = 36$	**Write the left hand side as a square.**
$\sqrt{(x - 4)^2} = \sqrt{36}$	**Take the square root of each side.**
$x - 4 = \pm 6$	**Simplify.**
$x - 4 = 6$ or $x - 4 = -6$	**Write as two equations.**
$x = 10$ or $x = -2$	**Solve.**

Check by substituting $x = 10$ and $x = -2$ into the original equation.

Exercises

Tell what is done in each step of the solution.

1. $3x^2 + 6x - 45 = 0$

a. $x^2 + 2x - 15 = 0$

b. $x^2 + 2x = 15$

c. $x^2 + 2x + 1 = 15 + 1$

d. $(x + 1)^2 = 16$

e. $\sqrt{(x + 1)^2} = \sqrt{16}$

f. $x + 1 = \pm 4$

g. $x + 1 = 4$ or $x + 1 = -4$

h. $x = 3$ or $x = -5$

Solve each equation by completing the square. If necessary, round to the nearest hundredth.

2. $x^2 - 10x + 16 = 0$

3. $x^2 - 12x + 32 = 0$

4. $x^2 - 12x + 3 = 0$

5. $x^2 + 8x - 5 = 0$

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