NAME Vicy DATE PERIOD

1-4 Study Guide and Intervention *(continued)*

Solving Absolute Value Equations

Absolute Value Equations Use the definition of absolute value to solve equations containing absolute value expressions.

For real numbers a and b where $b \geq 0$
if $|a| = b$ then $a = b$ or $a = -b$

Always check your answers by substituting them into the original equation. Sometimes computed solutions are not actual solutions.

Example: Solve $|2x - 3| = 17$. Check your solutions.

Case 1 $2x - 3 = 17$
$+3 \quad +3$
$2x = 20$
$x = 10$

CHECK $|2(10) - 3| = 17$
$|20 - 3| = 17$
$|17| = 17$
$17 = 17$ ✓

Case 2 $2x - 3 = -17$
$+3 \quad +3$
$2x = -14$
$x = -7$

CHECK $|2(-7) - 3| = 17$
$|-14 - 3| = 17$
$|-17| = 17$
$17 = 17$ ✓

Exercises

Solve each equation. Check your solutions.

1. $|x + 15| = 37$

$x + 15 = 37$
$x = 22$

$|22 + 15| = 37$
$|37| = 37$
$37 = 37$ ✓

$x + 15 = -37$
$x = -52$

$|-52 + 15| = 37$
$|-37| = 37$
$37 = 37$ ✓

2. $|t - 4| - 5 = 0$ → $|t - 4| = 5$

$t - 4 = 5$
$t = 9$

$|9 - 4| = 5$
$|5| = 5$
$5 = 5$ ✓

$t - 4 = -5$
$t = -1$

$|-1 - 4| = 5$
$|-5| = 5$
$5 = 5$ ✓