2.23 Solving a Linear Equation with Absolute Value: Problem Type 1

• Example 1

Solve the equation

$|x - 3| = 4$

The equation is equivalent to

$(x - 3) = 4$ or $(x - 3) = -4$

$x - 3 = 4$ $\qquad$ $x - 3 = -4$ $\qquad$ Add 3 to both sides of the equation.

$x = 7$ $\qquad$ $x = -1$

Thus $x = 7$ or $x = -1$.

CHECK YOURSELF 1

Algebraically find the solution set for the equation.

$|x - 2| = 3$

• Example 2

Solve for x:

$|3x - 2| = 4$

We know that $|3x - 2| = 4$ is equivalent to

$3x - 2 = 4$ $\quad$ or $\quad$ $3x - 2 = -4$ $\qquad$ Add 2.

$3x = 6$ $\qquad$ $3x = -2$ $\qquad$ Divide by 3.

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

Thus, $x = 2$ or $x = -\frac{2}{3}$.

CHECK YOURSELF 2

Solve for x.

$|4x + 1| = 9$

CHECK YOURSELF ANSWERS

1. $|x - 2| = 3$
$x - 2 = 3$ or $x - 2 = -3$
$x = 5$ or $x = -1$.

2. $x = -\frac{5}{2}$ or $x = 2$.

2.23 Exercises

Name

Section Date

ANSWERS

1.

2.

3.

4.

5.

6.

7.

8.

Solve each equation.

1. $|x - 1| = 4$

2. $|x - 2| = 6$

3. $|2x - 1| = 6$

4. $|3x - 2| = 8$

5. $3|2x - 6| = 9$

6. $2|3x - 5| = 12$

7. $|5x - 2| = -3$

8. $|4x - 9| = -8$