

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

$$(x - 3) = 4 \text{ or } (x - 3) = -4$$

$$x - 3 = 4 \quad x - 3 = -4 \quad \text{Add 3 to both sides of the equation.}$$

$$x = 7 \quad x = -1$$

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

$$3x - 2 = 4 \quad \text{or} \quad 3x - 2 = -4 \quad \text{Add 2.}$$

$$3x = 6 \quad 3x = -2 \quad \text{Divide by 3.}$$

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

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 $x = 2$.

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Exercises

Name _____

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Date _____

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

A N S W E R S

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____