

# Algebra 1

Chapter 3  
Section 3-7

## Absolute Value Equations

$$|x| = 3$$

$$x = 3$$

OR ...

$$x = -3$$

$$|x + 1| = 1$$

$$x + 1 = 1 \quad \text{OR} \quad x + 1 = -1$$

$$x = 0 \quad \text{OR} \quad x = -2$$



# Absolute Value Equations

\*\*Checking Solutions

$$|x| - 4 = 6$$

$$|x| = 10$$

$$x = -10 \text{ or } x = 10$$

$$|4x| - 1 = 7$$

$$|4x| = 8$$

$$4x = 8 \text{ or } 4x = -8$$

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

$$3|x| = 6$$

$$|x| = 2$$

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

$$|12 - x| = 3x$$

$$12 - x = -3x \text{ or } 12 - x = 3x$$

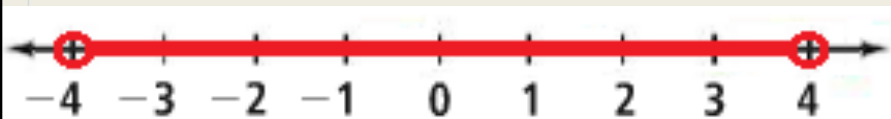
$$12 = -2x \text{ or } 12 = 4x$$

$$~~-6 = -x~~ \text{ or } 3 = x$$

# Inequalities With Absolute Value

$$|x| > 2$$

$$|x| \leq 4$$



$$x < -2 \text{ OR } x > 2 \quad -4 \leq x \leq 4$$

AND

# Solving Inequalities With Absolute Values

$$|2x - 7| \geq 3$$

$$2x - 7 \geq 3$$

$$2x \geq 10$$

$$x \geq 5$$

**OR**

$$2x - 7 \leq -3$$

$$2x \leq 4$$

$$x \leq 2$$

$$|5 - x| < 2$$

$$5 - x < 2$$

$$-x < -3$$

$$x > 3$$

**AND**

$$5 - x < 2$$

$$-x < -3$$

$$x > 3$$

$$|10 + 5x| < 20$$

$$-20 < 10 + 5x < 20$$

$$-30 < 5x < 10$$

$$-6 < x < 2$$

# Special Cases

$$|x| = -7$$

*no solution*

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$$|7x| > -12$$

*x is all real numbers*

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$$|3x - 2| \leq -9$$

*no solution*