Name _____ Date _____ Class _____

LESSON 2-8

# Practice C

## *Solving Absolute-Value Equations and Inequalities*

**Solve each equation.**

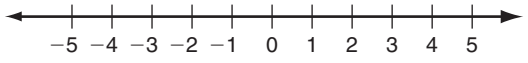
**1.** $|2x - 3| = 15$

**2.** $\frac{1}{2}|x + 9| = 1$

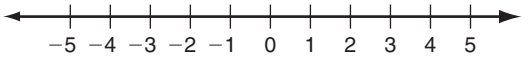
**3.** $11 - |4 - x| = 4$

**Solve and graph.**

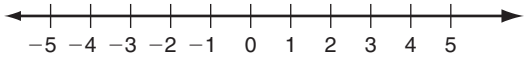
**4.** $5(7 - 2x) < 40$ and $5x + 2 < 12$



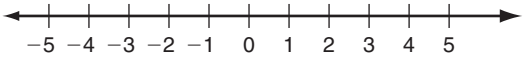

**5.** $\frac{7x - 10}{6} \leq 3$ or $3x + 2 > 5x - 8$



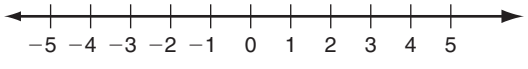

**6.** $\left|\frac{4x - 1}{6}\right| \geq 1$



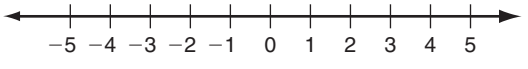

**7.** $-3|5x - 2| < -12$




**8.** $2|3x - 6| + 6 \geq 24$




**9.** $\frac{|9x + 1|}{4} < 2$




**Solve.**

**10.** Ben says that there is no solution for this absolute-value inequality. Is he correct? If not, solve the inequality. Explain how you know you are correct.

$$32 + \frac{|x - 7|}{13} < 7$$

LESSON 2-8

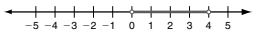
## Practice A

### Solving Absolute-Value Equations and Inequalities

**Solve each compound inequality. Then graph the solution.**

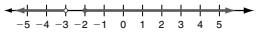
1. $2x < 8$ and $x + 3 > 3$

   $x < 4$ and $x > 0$



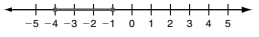
2. $x - 13 \geq -15$ or $4x < -12$

   $x \geq -2$ or $x < -3$



3. $4x \geq -16$ and $x + 1 \leq 0$

   $x \geq -4$ and $x \leq -1$



**Solve each equation.**

4. $|3x| = 36$

   $3x = 36$ or $3x = -36$

   $x = 12$ or $x = -12$

5. $|x| - 7 = -1$

   $x = 6$ or $x = -6$

6. $|8x| - 13 = 11$

   $x = 3$ or $x = -3$

**Determine whether each inequality is a conjunction or a disjunction and whether you would use *and* or *or*.**

7. $|4x| + 10 > 30$

   Disjunction, or

8. $|5x + 11| < 21$

   Conjunction, and

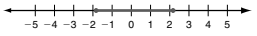
9. $3|x - 1| \geq 6$

   Disjunction, or

**Solve each inequality. Then graph the solution.**

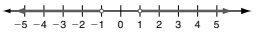
10. $\frac{|3x - 1|}{2} \leq 3$

    $-\frac{5}{3} \leq x \leq \frac{7}{3}$



11. $5|2x| > 10$

    $x < -1$ or $x > 1$



12. Phil told his friend that if you subtract 12 from his age and then take the absolute value, you'll get an answer of 3. How old is Phil?

    9 or 15





LESSON 2-8

## Practice B

### Solving Absolute-Value Equations and Inequalities

**Solve each equation.**

1. $|2x + 1| = 7$

   $x = 3$ or $x = -4$

2. $|-7x| = 28$

   $x = \pm 4$

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

   $x = \pm 1$

4. $|2x - 5| = 5$

5. $2|x + 1| = 14$

   $x = 6$ or $x = -8$

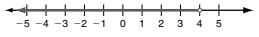
6. $|4 - x| + 2 = 9$

   $x = -3$ or $x = 11$

**Solve each inequality or compound inequality. Then graph the solution.**

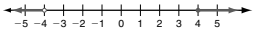
7. $-4x + 2 > -10$ and $5x - 12 < 8$

   $x < 4$



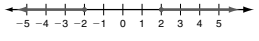
8. $3x - 4 \geq 8$ or $-x + 12 > 16$

   $x \geq 4$ or $x < -4$



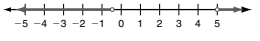
9. $|9x| \geq 18$

   $x \leq -2$ or $x \geq 2$



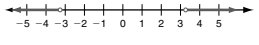
10. $|3x - 7| > 8$

    $x < -\frac{1}{3}$ or $x > 5$



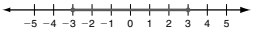
11. $|0.3x| > 1$

    $x < -\frac{10}{3}$ or $x > \frac{10}{3}$



12. $|7x| - 12 \leq 9$

    $x \geq -3$ and $x \leq 3$



**Solve.**

13. Any measurement is accurate within $\pm 0.5$ of the measurement unit. For example, if you measure your pencil to the nearest inch, your measurement could be 0.5 inch too long or 0.5 inch too short. Write an absolute-value inequality that shows the maximum and minimum actual measure of a nail measured to be 4.4 centimeters to the nearest 0.1 centimeter.

    $|m - 4.4| \leq 0.05$





LESSON 2-8

## Practice C

### Solving Absolute-Value Equations and Inequalities

**Solve each equation.**

1. $|2x - 3| = 15$

   $x = -6$ or $x = 9$

2. $\frac{1}{2}|x + 9| = 1$

   $x = -11$ or $x = -7$

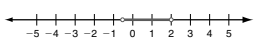
3. $11 - |4 - x| = 4$

   $x = -3$ or $x = 11$

**Solve and graph.**

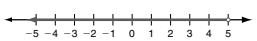
4. $5(7 - 2x) < 40$ and $5x + 2 < 12$

   $\frac{-1}{2} < x < 2$



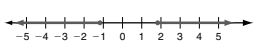
5. $\frac{7x - 10}{6} \leq 3$ or $3x + 2 > 5x - 8$

   $x < 5$



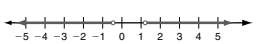
6. $\left|\frac{4x - 1}{6}\right| \geq 1$

   $x \leq -\frac{5}{4}$ or $x \geq \frac{7}{4}$



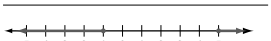
7. $-3|5x - 2| < -12$

   $x < -\frac{2}{5}$ or $x > \frac{6}{5}$



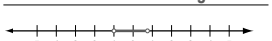
8. $2|3x - 6| + 6 \geq 24$

   $x \leq -1$ or $x \geq 5$



9. $\frac{|9x + 1|}{4} < 2$

   $x > -1$ and $x < \frac{7}{9}$



**Solve.**

10. Ben says that there is no solution for this absolute-value inequality. Is he correct? If not, solve the inequality. Explain how you know you are correct.

    $32 + \frac{|x - 7|}{13} < 7$

    Possible answer: Ben is correct. There is no solution. When the inequality is simplified, the result is an inequality that sets the absolute value of an expression less than a negative number. Since absolute values are always positive, this is never true.





LESSON 2-8

## Reteach

### Solving Absolute-Value Equations and Inequalities

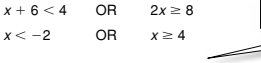
To solve compound inequalities, solve both inequalities. Then graph.

Solve $x + 6 < 4$ or $2x \geq 8$.

$x + 6 < 4$ OR $2x \geq 8$

$x < -2$ OR $x \geq 4$

This inequality uses OR. Its graph has two parts.

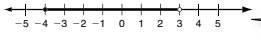


Solve $x - 2 < 1$ and $-3x \leq 12$.

$x - 2 < 1$ AND $-3x \leq 12$

$x < 3$ AND $x \geq -4$

Reverse the inequality when dividing by a negative number.

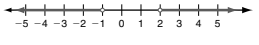


This inequality uses AND. Its graph has one part.

**Solve and graph each compound inequality.**

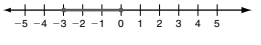
1. $x + 3 < 2$ or $\frac{1}{2}x > 1$

   $x < -1$ OR $x > 2$



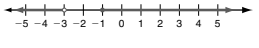
2. $-6x \leq 18$ and $x + 6 \leq 6$

   $x \geq -3$ AND $x \leq 0$



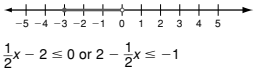
3. $x - 4 < -7$ or $-4x \leq 4$

   $x < -3$ OR $x \geq -1$



4. $-3x \leq 6$ and $x + 2 < 5$

   $x \geq -2$ AND $x < 3$



5. $3x < 12$ and $-3x < 12$

   $x < 4$ and $x > -4$



6. $\frac{1}{2}x - 2 \leq 0$ or $2 - \frac{1}{2}x \leq -1$

   $x \leq 4$ or $x \geq 5$