NAME _____

Module 5   Solving Linear Inequalities of
One Variable
Lesson 4   Solving Multi-Step Linear Inequalities

**independent
practice**

Solve and graph.

1. $3x - 12 > 9x$ **x < –2** _____

$$-5\ -4\ -3\ -2\ -1\ \ 0\ \ 1\ \ 2\ \ 3\ \ 4\ \ 5$$

2. $8x \le -2x - 10$ **x ≤ –1** _____

$$-5\ -4\ -3\ -2\ -1\ \ 0\ \ 1\ \ 2\ \ 3\ \ 4\ \ 5$$

3. $-5x - 4 \ge -3x$ **x ≤ –2** _____

$$-5\ -4\ -3\ -2\ -1\ \ 0\ \ 1\ \ 2\ \ 3\ \ 4\ \ 5$$

4. $2x - 8 \ge -2x$ **x ≥ 2** _____

$$-5\ -4\ -3\ -2\ -1\ \ 0\ \ 1\ \ 2\ \ 3\ \ 4\ \ 5$$

5. $5x - 7 \ge -2x + 7$ **x ≥ 2** _____

$$-5\ -4\ -3\ -2\ -1\ \ 0\ \ 1\ \ 2\ \ 3\ \ 4\ \ 5$$

6. $-2x - 3 > -5x + 9$ **x > 4** _____

$$0\ \ 1\ \ 2\ \ 3\ \ 4\ \ 5\ \ 6\ \ 7\ \ 8\ \ 9\ \ 10$$

7. $8x - 9 \le 5x + 3$ **x ≤ 4** _____

$$0\ \ 1\ \ 2\ \ 3\ \ 4\ \ 5\ \ 6\ \ 7\ \ 8\ \ 9\ \ 10$$

8. $-7x - 27 \ge 2x + 9$ **x ≤ –4** _____

$$-10\ -9\ -8\ -7\ -6\ -5\ -4\ -3\ -2\ -1\ \ 0$$

9. $18 - 4x \ge 3 - x$ **x ≤ 5** _____

$$0\ \ 1\ \ 2\ \ 3\ \ 4\ \ 5\ \ 6\ \ 7\ \ 8\ \ 9\ \ 10$$

10. $20 - 6x \le 5x + 9$ **x ≥ 1** _____

$$-5\ -4\ -3\ -2\ -1\ \ 0\ \ 1\ \ 2\ \ 3\ \ 4\ \ 5$$

11. $-(x - 12) \ge 5x$ **x ≤ 2** _____

$$-5\ -4\ -3\ -2\ -1\ \ 0\ \ 1\ \ 2\ \ 3\ \ 4\ \ 5$$

12. $7x \ge -3(x - 10)$ **x ≥ 3** _____

$$0\ \ 1\ \ 2\ \ 3\ \ 4\ \ 5\ \ 6\ \ 7\ \ 8\ \ 9\ \ 10$$

13. $4x - 2 \geq 10x + 16$ **x ≤ –3**

14. $3x - 5x \geq 12 - 4$ **x ≤ –4**

15. $-2(x - 7) + 1 \geq 3x$ **x ≤ 3**

16. $5 - 2(x + 5) > 3 - 4x$ **x > 4**

17. $8 - 4x + 12 \geq 3x - 2(x - 5)$ **x ≤ 2**

18. $2(x - 5) - 4 \geq 3x - 2 + 5x$ **x ≤ –2**

19. $15 - (x - 9) \geq 3(x + 4) - 2x$ **x ≤ 6**

20. $10(x - 4) - 2x < 4(x - 6) + 24$ **x < 10**

Journal

1. Solve and graph the solution set to the inequality $2x > 3 + 2x$. What is the solution set? Explain.

2. Solve and graph the solution set to the inequality $-6x - 4 < -2(3x - 8)$. What is the solution set? Explain.

3. Tina solved the inequality $4x - 6 > -2x + 6$ and got an answer of $x > 6$. To test her answer, she used the point $x = 10$, and found that the value satisfied the equation. Tina concluded that her answer was correct. Is she correct in this assumption? Explain.

4. For the inequality $3(x - 2) + 5 > x + 2$, show the solution one step at a time. For each step, describe what is being done to the inequality, and explain why. Be sure to use correct algebraic language.

5. Show that the inequality $4 - 2x > 3 - 4x$ is equivalent to the inequality $2x - 4 < 4x - 3$.

Cumulative Review

Simplify.

1. $-3 - (-4)$ **1**

2. $5 \cdot -6^2$ **–180**

3. $[(4 - 6)^3]^2$ **64**

4. $8 - (5 - 10)$ **13**

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Evaluate.

5. $3x - 4$ when $x = -6$ **–22**

6. $10 - 3x$ when $x = -1$ **13**

7. $\frac{6x - 8}{4 - 2x}$ when $x = \frac{1}{2}$ **$-\frac{5}{3}$ or $-1\frac{2}{3}$**

8. $\sqrt{\frac{-2x + 4}{x + 7}}$ when $x = -4$ **2**

Solve for the given variable.

9. $C = 2\pi r$ for r

$r = \frac{C}{2\pi}$

10. $SA = 2\pi r^2 + 2\pi rh$ for h

$h = \frac{SA - 2\pi r^2}{2\pi r}$

Possible Journal Answers
1. **To solve $2x > 3 + 2x$, then $0 > 3$, which is a false statement. This inequality has no solution. Its solution set is an empty number line.**
2. **To solve $-6x - 4 < -2(3x - 8)$, then $-6x - 4 < -6x + 16$, which gives $-4 < 16$. This is a true statement. The inequality is true for all real numbers. The graph of its solution set is the entire number line.**
3. **Tina can not use the test of one value to conclude that her solution is correct. Even though $x = 10$ satisfies the inequality, it is only because that value happens to fall in the true solution set of the inequality, which is $x > 2$.**
4. **$3(x - 2) + 5 > x + 2$**

$3x - 6 + 5 > x + 2$	**Distributive Property of Multiplication Over Addition**
$3x - 1 > x + 2$	**Addition, Combine Like Terms**
$3x - 1 - x > x + 2 - x$	**Subtraction Property of Inequality**
$2x - 1 > 2$	**Subtraction, Combine Like Terms**
$2x - 1 + 1 > 2 + 1$	**Addition Property of Inequality**
$2x > 3$	**Combine like terms**
$\frac{2x}{2} > \frac{3}{2}$	**Division Property of Inequality**
$x > \frac{3}{2}$	**Division**

5. $4 - 2x > 3 - 4x$

$-1(4 - 2x) < -1(3 - 4x)$	**Multiply both sides by –1**
$-4 + 2x < -3 + 4x$	**Distribute**
$2x - 4 < 4x - 3$	**Use the Commutative Property of Addition to re-order terms**

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