Name _____
Date _____

Solving Two-Step Inequalities

KEY IDEA
An inequality is solved exactly like an equation, with one extra rule: if you multiply or divide both sides by a negative number, the inequality symbol reverses. The solution is a range of values, not a single number, so it is graphed on a number line — an open circle for < and >, a closed circle for ≤ and ≥.

How to do it

1. Undo the addition or subtraction on both sides.
2. Undo the multiplication or division on both sides.
3. If that last step used a negative number, reverse the inequality symbol.
4. Graph the solution: closed circle if the endpoint is included, open circle if it is not, then shade the direction that makes the statement true.

Worked examples

Example 1. $-8x - 11 > 61$

$x < -9$

Example 2. $-8x + 9 > -55$

$x < 8$

Example 3. $2x + 3 \leq -7$

$x \leq -5$

Example 4. $6x - 11 > -65$

$x > -9$

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Directions: Solve each inequality. Remember to reverse the symbol when you multiply or divide by a negative.

1. $6x + 2 > 44$

2. $-4x - 5 > 27$

3. $-5x - 10 \leq -45$

4. $-3x - 6 \geq -24$

5. $2x - 11 \geq 3$

6. $8x + 7 > 15$

7. $-2x + 4 > 4$

8. $7x + 8 \leq -6$

9. $7x - 3 \geq 4$

10. $-7x - 8 > 27$

11. $-4x - 9 \geq 3$

12. $-2x - 7 > -19$

13. $-8x - 2 \leq -74$

14. $2x - 7 > -9$

15. $2x - 9 \geq -5$

16. $-6x + 10 \leq 28$

17. $-4x + 9 > 13$

18. $8x + 10 < -6$

19. $-6x + 5 \geq -37$

20. $-8x - 7 < 25$