

Solving linear inequalities



Solve each inequality. Remember to flip the sign when you multiply or divide both sides by a negative number.

Name _____

Date _____

Flip the sign on a negative step

An inequality solves just like an equation, except that multiplying or dividing both sides by a negative number turns the inequality sign around.

Worked example Solve $-2x > 10$.

$$\begin{array}{ccc} -2x & > & 10 \\ & \swarrow \text{flips} & \\ x & < & -5 \end{array} \quad \begin{array}{c} \downarrow \div (-2) \\ \text{both sides } (-ve) \end{array}$$

Divide both sides by -2 (a negative number).
Flip the inequality sign: $x < -5$.

1. Solve $3x + 2 > 14$.

2. Solve $5x - 3 \leq 17$.

3. Solve $\frac{x}{3} + 4 < 9$.

4. Solve $2x - 5 \geq 9$.

5. Solve $-2x < 8$.

6. Solve $-x - 3 \geq 2$.

7. Solve $8 - 3x \leq 2$.

8. Solve $6 - 2x > -4$.

9. Solve $4x + 3 \leq 2x + 11$.

Solving linear inequalities (continued)



Solve each inequality. Remember to flip the sign when you multiply or divide both sides by a negative number.

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10. Solve $5x - 2 > 3x + 6$.

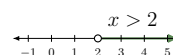
11. Solve $-2 < 3x - 2 \leq 10$.

12. Solve $-9 \leq 4x + 3 < 15$.

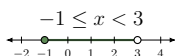
13. Solve $3(x + 2) < 2x + 11$.

14. Solve $-4(x - 1) \leq 16$.

15. Write the inequality shown.



16. Write the compound inequality shown.



17. A student solves $-4x > 12$ by writing $x > -3$. Explain the error and give the correct solution set.

18. Solve $-5 \leq 3x + 1 < 7$.
