

Solving One-Step Inequalities

Algebra 1 • Section 3.1

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Quick Review and Helpful Hints

Inequalities solve almost like equations, but dividing or multiplying by a negative reverses the sign. For absolute value, think distance: less-than makes a band, while greater-than usually splits into two rays.

▷ **Example:** Solve $-2x + 5 < 13$.

Work: Subtract 5 to get $-2x < 8$. Divide by -2 and reverse the inequality: $x > -4$.

★ **Answer:** $x > -4$

◆ Practice Problems

Solve each problem. Show enough work that another student could follow your thinking.

1. Solve $x + 6 > 14$.

6. Solve $-x < 10$.

2. Solve $y - 9 \leq 3$.

7. Solve $b + 2.5 \geq 9$.

3. Solve $4m < 28$.

8. Solve $r - \frac{1}{2} < \frac{3}{4}$.

4. Solve $-3p \geq 18$.

9. Solve $12 \leq 2n$.

5. Solve $\frac{a}{5} > 6$.

10. Solve $-8 > q + 1$.

◆ Word Problems

11. A bus can hold at most 48 passengers. Write an inequality for passengers p .

12. A player needs more than 25 points to advance. Write an inequality.



Answer Keys

1. $x > 8$

2. $y \leq 12$

3. $m < 7$

4. $p \leq -6$

5. $a > 30$

6. $x > -10$

7. $b \geq 6.5$

8. $r < \frac{5}{4}$

9. $n \geq 6$

10. $q < -9$

11. $p \leq 48$

12. $p > 25$

Step-by-Step Explanations

1. Just lift the $+6$ off both sides; no sign worries here since you're only subtracting.
2. Add 9 back to both sides to undo the subtraction — the \leq happily stays as is.
3. Dividing by the positive 4 keeps everything pointing the same way, so $m < 7$.
4. This is the classic flip: dividing by -3 turns \geq around into \leq .
5. Multiply both sides by 5, a positive number, so the inequality direction is safe.
6. Multiplying through by -1 to free x reverses the sign — $<$ becomes $>$.

7. Take 2.5 off both sides; subtraction never disturbs the inequality, so $b \geq 6.5$.
8. Add $\frac{1}{2}$ to each side, and combining the fractions gives $\frac{3}{4} + \frac{1}{2} = \frac{5}{4}$.
9. Split both sides by the positive 2; the relation holds, and reading it back gives $n \geq 6$.
10. Subtract 1 from both sides — flipping it to $q + 1 < -8$ first can make it click.
11. 'At most' sets a ceiling that 48 itself reaches, so p can equal 48 or anything less.
12. 'More than' is strict — scoring exactly 25 isn't enough, so use $>$ rather than \geq .



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