

# Solving One-Step Inequalities

Algebra 1 • Section 3.1

Name: \_\_\_\_\_

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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.  $p > 25$

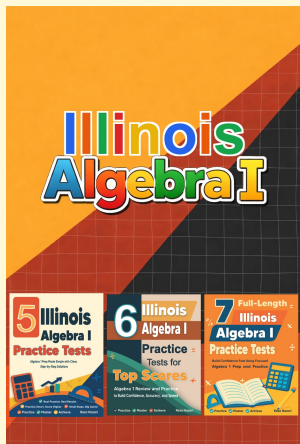
### Step-by-Step Explanations

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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