

3-6 Study Guide

Solving Inequalities by Adding or Subtracting

An **inequality** is a mathematical sentence that contains one of these symbols: $<$, $>$, \leq , \geq , or \neq . The meaning of each is given at the right.

Symbol	Meaning
$<$	less than
$>$	greater than
\leq	less than or equal to
\geq	greater than or equal to
\neq	not equal to

The same steps used to solve equations are used to solve inequalities.

Example: Solve $x + 6 > 11$.

$$\begin{aligned} x + 6 &> 11 \\ -x + 6 - 6 &> 11 - 6 && \text{Subtract 6 from} \\ x &> 5 && \text{each side.} \end{aligned}$$

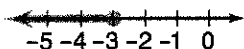
Check: Pick a number greater than 5.

Use 8.

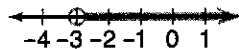
$$\begin{aligned} x + 6 &> 11 \\ 8 + 6 &\overset{?}{>} 11 && \text{Replace } x \text{ with the number 8.} \\ 14 &> 11 && \text{The statement is true, so it} \\ &&& \text{checks.} \end{aligned}$$

The solution to an inequality with one variable can be shown on a number line. A closed dot is used when the point is included in the solution. An open circle is used when the point is *not* included in the solution.

Examples: $x - 3 \leq -6$
 $x \leq -3$

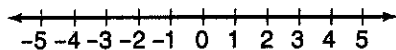


$x - 3 > -6$
 $x > -3$

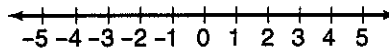


Solve each inequality and check your solution. Then graph the solution on the number line.

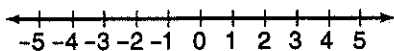
1. $-1 > x + 3$



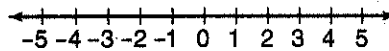
2. $t + 9 \geq 6$



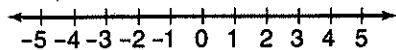
3. $-5 \leq r - 3$



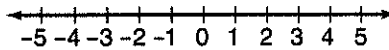
4. $-7 + m \geq -9$

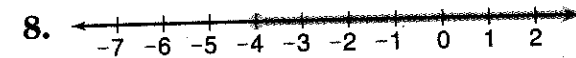
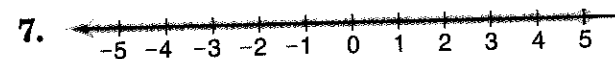
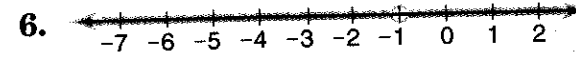
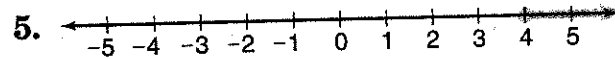
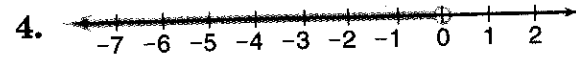
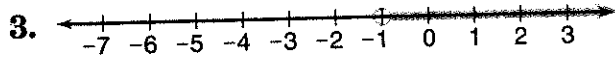
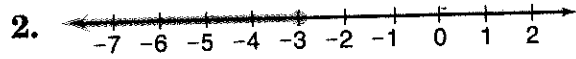
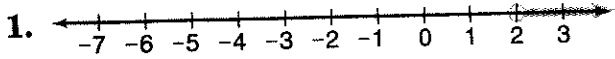


5. $b - 14 < -10$

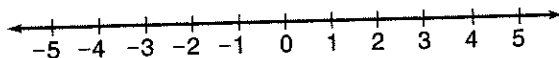


6. $8 + y \geq 6$

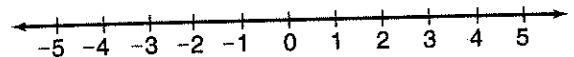


3-6 Practice**Solving Inequalities by Adding or Subtracting***Write an inequality for each solution set graphed below.**Solve each inequality and check your solution. Then graph the solution on the number line.*

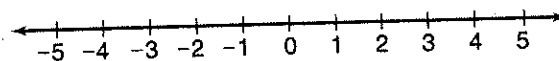
9. $x + 3 \geq 1$



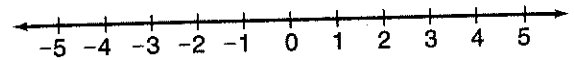
10. $x - 8 > -6$



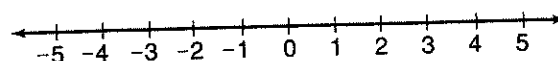
11. $x + 21 > 25$



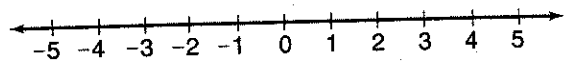
12. $-12 + x \leq -16$



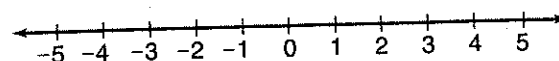
13. $-3 > x - 4$



14. $x + 1\frac{1}{2} > 2\frac{1}{2}$



15. $x - 7 \geq -11$



16. $x - 6 > -6$

