

7. 6 Solving Inequalities Using Addition or Subtraction

ESSENTIAL QUESTION: How can you use addition or subtraction to solve an inequality?

SOLVING INEQUALITIES USING ADDITION AND SUBTRACTION

1) Get variable by itself by either adding or subtracting on both sides just like you were solving an equation.

2) Answer will have a variable, inequality sign and a number

3) Graph your solution on a number line.

* $<$ or $>$ is an open circle

* \leq or \geq is a closed circle

EXAMPLE 1->Solve an Inequality Using Addition.

Solve the inequality. Graph the solution.

1) $x - 3 > 1$

$$\begin{array}{r} +3 \quad +3 \\ x - 3 > 1 \\ \hline x > 4 \end{array}$$

2) $x - 2 < 3$

$$\begin{array}{r} +2 \quad +2 \\ x - 2 < 3 \\ \hline x < 5 \end{array}$$

3) $x - 6 \geq 4$

$$\begin{array}{r} +6 \quad +6 \\ x - 6 \geq 4 \\ \hline x \geq 10 \end{array}$$

4) $10 \geq x - 1$

$$\begin{array}{r} +1 \quad +1 \\ 10 \geq x - 1 \\ \hline 10 \geq x \\ x \leq 10 \end{array}$$

EXAMPLE 2->Solve an Inequality Using Subtraction

Solve the inequality. Graph the solution.

1) $15 \geq 6 + x$

$$\begin{array}{r} -6 \quad -6 \\ 15 \geq 6 + x \\ \hline 9 \geq x \\ x \leq 9 \end{array}$$

2) $x + 3 > 7$

$$\begin{array}{r} -3 \quad -3 \\ x + 3 > 7 \\ \hline x > 4 \end{array}$$

3) $y + 2 < 17$

$$\begin{array}{r} -2 \quad -2 \\ y + 2 < 17 \\ \hline y < 15 \end{array}$$

4) $16 \leq m + 9$

$$\begin{array}{r} -9 \quad -9 \\ 16 \leq m + 9 \\ \hline 7 \leq m \\ m \geq 7 \end{array}$$

EXAMPLE 3->Real Life Application

A flea market advertises that it has more than 250 vending booths. Of these, 184 are currently filled. Write and solve an inequality to represent the number of vending booths still available.

$$\begin{array}{r} x + 184 > 250 \\ -184 \quad -184 \\ \hline x > 66 \end{array}$$

More than 66 vending booths are still available.