3.6 Solving Multi-Step Inequalities

Goal: Solve multi-step inequalities.

Example 1 ***Writing and Solving a Multi-Step Inequality***

Charity Walk You are participating in a charity walk. You want to raise at least $500 for the charity. You already have $175 by asking people to pledge $25 each. How many more $25 pledges do you need?

Solution

Let p represent the number of additional pledges. Write a verbal model.

$$\square + \square \cdot \square \geq \square$$

$\square + \square \geq \square$	Substitute.
$\square + \square - \square \geq \square - \square$	Subtract $\square$ from each side.
$\square \geq \square$	Simplify.
$\frac{\square}{\square} \geq \frac{\square}{\square}$	Divide each side by $\square$.
$p \geq \square$	Simplify.

Answer: You need at least $\square$ more $25 pledges.

Checkpoint

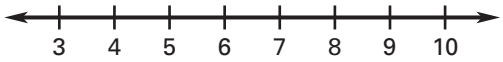
1. Look back at Example 1. Suppose you wanted to raise at least $620 and you already have raised $380 by asking people to pledge $20 each. How many more $20 pledges do you need?

Example 2 *Solving a Multi-Step Inequality*

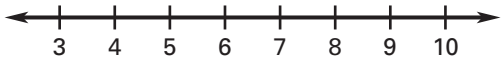
$\frac{x}{-3} - 9 < -7$	Original inequality
$\frac{x}{-3} - 9 + \square < -7 + \square$	Add $\square$ to each side.
$\frac{x}{-3} < \square$	Simplify.
$\square\left(\frac{x}{-3}\right)\square\ \square \cdot \square$	Multiply each side by $\square$. Reverse inequality symbol.
$x\ \square\ \square$	Simplify.

✔ ***Checkpoint*** **Solve the inequality. Then graph the solution.**

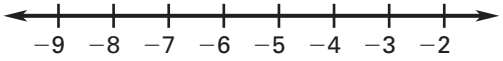
2. $2x + 9 < 25$



3. $-3 \geq \frac{x}{-4} - 2$



4. $2 > -4 - x$



5. $\frac{x}{2} + 4 \leq 9$