CCSS: 6.EE.5

Lesson 20: Solving Inequalities

An **inequality** is a mathematical sentence comparing two expressions that are not equal. An inequality may use one of the following symbols: $<$ or $>$. The symbol $>$ means "is greater than." The symbol $<$ means "is less than."

To solve inequalities, follow the same rules as for solving equations. Use inverse operations to isolate the variable.

Example

Solve the following inequality for x.

$5x < -35$

Use inverse operations to solve for x.

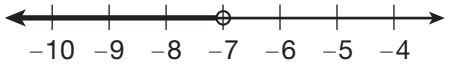
$5x < -35$

$\frac{5x}{5} < -\frac{35}{5}$ **Divide both sides by 5.**

$x < -7$

The solution set for the inequality is $x < -7$.

The graph of the solution set is shown below.



Notice that the dot on -7 is open. This means that -7 is not included as part of the solution set.

To check the answer, substitute any number less than -7 for x. Use $x = -8$.

$5x < -35$
$5(-8) < -35$
$-40 < -35$

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Example

Solve the following inequality for *x*.

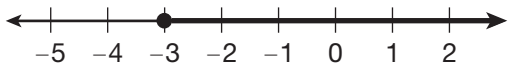
$8 + x \geq 5$

Use inverse operations to solve for x.

$8 + x \geq 5$
$8 - 8 + x \geq 5 - 8$ **Subtract 8 from both sides.**
$x \geq -3$

The solution set for the inequality is $x \geq -3$.

The graph of the solution set is shown below.



Notice that the dot on -3 is filled in. This means that -3 is included in the solution set.

To check the answer, substitute any number greater than or equal to -3 for *x*. Use $x = 0$.

$8 + x \geq 5$
$8 + (0) \geq 5$
$8 \geq 5$

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