

Subtraction Property of Inequality

Words Subtracting the same number from each side of an inequality produces an equivalent inequality.

Algebra If $a > b$, then $a - c > b - c$. If $a \geq b$, then $a - c \geq b - c$.
 If $a < b$, then $a - c < b - c$. If $a \leq b$, then $a - c \leq b - c$.

EXAMPLE 4 Solve an inequality using subtraction

Solve $9 \geq x + 7$. Graph your solution.

$$9 \geq x + 7 \quad \text{Write original inequality.}$$

$$9 - 7 \geq x + 7 - 7 \quad \text{Subtract 7 from each side.}$$

$$2 \geq x \quad \text{Simplify.}$$

▶ You can rewrite $2 \geq x$ as $x \leq 2$. The solutions are all real numbers less than or equal to 2.



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EXAMPLE 5 Solve a real-world problem**READING**

The phrase “no more than” indicates that you use the \leq symbol.

LUGGAGE WEIGHTS You are checking a bag at an airport. Bags can weigh no more than 50 pounds. Your bag weighs 16.8 pounds. Find the possible weights w (in pounds) that you can add to the bag.

Solution

Write a verbal model. Then write and solve an inequality.

Weight of bag	+	Weight you can add	≤	Weight limit
↓		↓		↓
16.8	+	w	≤	50

$$16.8 + w \leq 50 \quad \text{Write inequality.}$$

$$16.8 + w - 16.8 \leq 50 - 16.8 \quad \text{Subtract 16.8 from each side.}$$

$$w \leq 33.2 \quad \text{Simplify.}$$

▶ You can add no more than 33.2 pounds.

**GUIDED PRACTICE** for Examples 4 and 5

7. Solve $y + 5.5 > 6$. Graph your solution.
8. **WHAT IF?** In Example 5, suppose your bag weighs 29.1 pounds. Find the possible weights (in pounds) that you can add to the bag.