

6-6

Solving One-Step Inequalities

What You'll Learn

To solve one-step inequalities by adding or subtracting

CONTENT STANDARDS**6.EE.5****Why Learn This?**

You can solve inequalities when you need to find an unknown amount. For example, you can determine how close you are to meeting a goal in sports or in business.



To solve an inequality, use inverse operations to get the variable alone.

EXAMPLES Solving Inequalities

1 Solve $s - 7 < 3$.

$$s - 7 < 3$$

$$s - 7 + 7 < 3 + 7 \quad \leftarrow \text{Add 7 to each side to undo the subtraction.}$$

$$s < 10 \quad \leftarrow \text{Simplify.}$$

Examples

① **Solving Inequalities** Solve $f - 4 \geq 8$.

$$f - 4 \geq 8$$

$$f - 4 + 4 \geq 8 + \square \quad \leftarrow \text{Add 4 to each side to undo the subtraction.}$$

$$f \geq \square \quad \leftarrow \text{Simplify.}$$

EXAMPLES Solving Inequalities

② Solve $n + 12 \geq 18$.

$$n + 12 \geq 18$$

$$n + 12 - 12 \geq 18 - 12 \quad \leftarrow \text{Subtract 12 from each side to undo the addition.}$$

$$n \geq 6 \quad \leftarrow \text{Simplify.}$$

2 Solving Inequalities Solve $p + 16 < 34$.

$$p + 16 < 34$$

$$p + 16 - \boxed{} < 34 - \boxed{} \quad \leftarrow \text{Subtract 16 from each side to undo the addition.}$$

$$p < \boxed{} \quad \leftarrow \text{Simplify.}$$

Quick Check

Table talk

1. Solve $u - 6 \leq 3$.

Quick Check**Table talk**

2. Solve $z + 15 > 24$.

EXAMPLE Application: Running

3 A marathon runner plans to run at least 55 miles this week. He has already run 42 miles. Write and solve an inequality to find how many more miles he plans to run this week.

Words miles run + miles left is at least 55 miles



Let m = number of miles left.

Inequality $42 + m \geq 55$

$$42 + m \geq 55$$

$$42 + m - 42 \geq 55 - 42 \quad \leftarrow \text{Subtract 42 from each side.}$$

$$m \geq 13 \quad \leftarrow \text{Simplify.}$$

The marathon runner plans to run at least 13 more miles this week.

Example

- 3 **Saving Money** Missy wants to save at least \$150 this month. She has saved \$112 so far. Write and solve an inequality to find how much more money she would like to save this month.

Words

amount saved	+	amount to save	is at least	\$150
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**Inequality**Let d = the amount Missy still needs to save.

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

$$112 + d \geq 150$$

$$112 - \square + d \geq 150 - \square \leftarrow \text{Subtract 112 from each side.}$$

$$d \geq \square \leftarrow \text{Simplify.}$$

Missy would like to save at least \square more this month.

Try this one on your own, then compare with your table partners.

Quick Check

3. A restaurant can serve a maximum of 115 people. There are now 97 people dining in the restaurant. Write and solve an inequality to find how many more people can be served.

 **Check Your Understanding**

Name the operation used to solve each inequality.

1. $c - 4 \geq 8$

2. $n + 2 < 13$

3. $t + 11 \leq 11$

Name _____ Class _____ Date _____

Practice 6-6 Solving One-Step Inequalities

Solve each inequality.

1. $x - 5 < 15$

2. $m + 7 \geq 12$

3. $g - (-4) \geq 0$

4. $-6 > b - 24$

5. $q + 9 < 60$

6. $h + (-1) > -1$

Write an inequality for each sentence. Then solve the inequality.

7. Five is greater than a number minus 2. _____

8. Twenty is less than or equal to a number plus 4. _____

9. A number minus 5 is greater than 25. _____

Write an inequality for each problem. Then solve the inequality.

10. You and the chess teacher have been playing chess for 18 minutes. To make the chess club, you must win the game in less than 45 minutes. How much time do you have to win the chess game?

11. Your phone card allows you to talk long distance for up to 120 minutes. You have been on a long-distance call for 72 minutes. How much longer do you have to talk before your phone card expires?

Solve each inequality mentally.

12. $x - 28 < 108$

13. $x - 18 \geq 12$

14. $g + 12 > 20$

15. $k - 4 \geq 25$
