3-2   **Reteaching**

Solving Inequalities Using Addition or Subtraction

You can add the same number to each side of an equation. You can also add the same number to each side of an inequality.
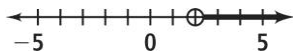
Problem

What are the solutions of $b - 4 > -2$? Graph and check the solutions.

$b - 4 > -2$	Original inequality.
$b - 4 + 4 > -2 + 4$	Add 4 to each side.
$b > 2$	Simplify.

To graph $b > 2$, place an open circle at 2 and shade to the right.

To check the endpoint of $b > 2$, make sure that 2 is the solution of the related equation $b - 4 = -2$.

$b - 4 = -2$

$2 - 4 \overset{?}{=} -2$

$2 = 2$ ✓

Then check to see if a number greater than 2 is a solution of the inequality 5 is greater than 2.

$b - 4 > -2$

$5 - 4 \overset{?}{>} -2$

$1 > -2$ ✓

Exercises

Solve each inequality. Graph and check your solutions.

1. $m - 14 \geq -10$ **2.** $t - 2 < 4$

3. $y - 3 \leq 4$ **4.** $d - 9 \geq -12$

5. $w - 17 > 13$ **6.** $a - 22 < -7$

7. Writing. Explain how you would solve $t - 15 \leq 5$.

8. Anita is baking dinner rolls and pumpkin bread. She needs 4 cups of flour for the rolls. She needs at least 7 cups of flour left for the pumpkin bread. Write and solve an inequality to determine how much flour Anita needs before she starts baking.
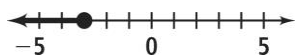
You can subtract the same number from each side of an equation. You can also subtract the same number from each side of an inequality.

Problem

What are the solutions of $h + 7 \leq 4$? Graph and check the solutions.

$h + 7 \leq 4$ Original inequality.

$h + 7 - 7 \leq 4 - 7$ Subtract 7 from each side.

$h \leq -3$ Simplify.

To graph $h \leq -3$, place a closed circle at -3 and shade to the left.

To check the endpoint of $h \leq -3$, make sure that -3 is the solution of the related equation $h + 7 = 4$.

$h + 7 = 4$

$\overset{?}{-3 + 7 = 4}$

$4 = 4$ ✓

Then check to see if a number less than -3 is a solution of the inequality. -4 is less than -3.

$h + 7 \leq 4$

$\overset{?}{-4 + 7 \leq 4}$

$3 \leq 4$ ✓

Exercises

Solve each inequality. Graph and check your solutions.

9. $s + 7 \geq 12$ **10.** $p + 3 < -1$

11. $b + 5 \leq -4$ **12.** $n + 1 \geq 8$

13. $v + 18 > -12$ **14.** $k + 26 < 6$

15. A boat can hold up to 1000 pounds. Two friends get in the boat. Together they weigh 285 pounds. Write and solve an inequality to determine how much more weight can be added to the boat.

Extra Practice Lesson 3-2

Solve each inequality. Graph and check your solution.

1. $9 + p \leq 17$

2. $t - 5 \geq -13$

3. $9 - t \leq 4$

4. $m + 4 \geq 8$

5. $y + 3 < 16$

6. $n - 6 \leq 8.5$

Define a variable and write an inequality for each situation.

7. The booster club raised $102 in their car wash. They want to buy $18 soccer balls for the soccer team. Write and solve an inequality to find how many soccer balls they can buy.

Write and solve an inequality for each situation.

8. Suppose you are trying to increase your coin collection to at least 500 coins. How many more coins do you need if you already have a collection of 375 coins?

9. Janet has a balance of $125 on a credit card. On her next statement, she wants to reduce her balance to no more than $60. How much does she need to pay off ?