

Inequalities

= EQUAL

$$2 + x = 7; x = 5$$

$$2 + 3 = 5$$

< IS LESS THAN

$$2 + x < 7; x < 5$$

$$4 < 5$$

≤ IS LESS THAN OR EQUAL TO

$$2 + x \leq 7; x \leq 5$$

SPEED
25
LIMIT

> IS GREATER THAN

$$2 + x > 7; x > 5$$

$$5 < 4$$

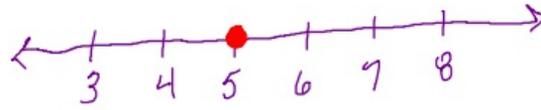
≥ IS GREATER THAN OR EQUAL TO

$$2 + x \geq 7; x \geq 5$$

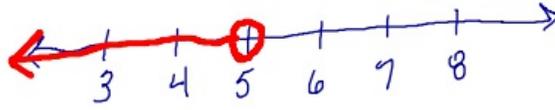
AT LEAST
YOU MUST BE THIS TALL
TO RIDE THIS RIDE

Graphing Inequalities

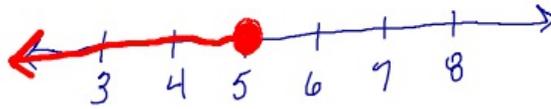
$x = 5$



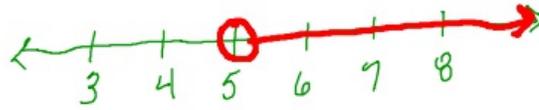
$x < 5$



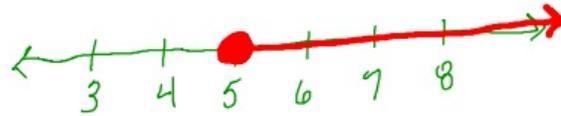
$x \leq 5$



$x > 5$



$x \geq 5$



Lesson 6 - Solve Inequalities by Addition or Subtraction

Solving an inequality means finding values for the variable that make the inequality true. You can use the Addition and Subtraction Properties of Inequality to help solve an inequality. When you add or subtract the same number from each side of an inequality, the inequality remains true.

Examples

Solve each inequality.

1 $x + 4 > 9$ Write the inequality.
 $x + 4 - 4 > 9 - 4$ Subtract 4 from each side.
 $x > 5$ Simplify.

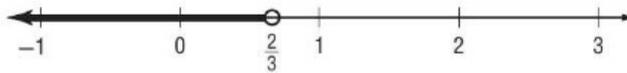
Any number greater than 5 will make the statement true. Therefore, the solution is $x > 5$.

2 $-12 \geq n - 9$ Write the inequality.
 $-12 + 9 \geq n - 9 + 9$ Add 9 to each side.
 $-3 \geq n$ Simplify.

The solution is $-3 \geq n$ or $n \leq -3$.

3 Solve $a + \frac{1}{3} < 1$. Graph the solution set on a number line.

$a + \frac{1}{3} < 1$ Write the inequality.
 $a + \frac{1}{3} - \frac{1}{3} < 1 - \frac{1}{3}$ Subtract $\frac{1}{3}$ from each side.
 $a < \frac{2}{3}$ Simplify.



$4 < 5 \rightarrow 5 > 4$
 $6 > 0 \rightarrow 0 < 6$
 $-3 < 2 \rightarrow 2 > -3$
 $-5 > x \rightarrow x < -5$

Exercises

Solve each inequality.

1. $t - 6 > 3$
 $+6 \quad +6$
 $t > 9$

$t - 6 = 3$
 $+6 \quad +6$
 $t = 9$

2. $b + 9 \leq 2$
 $-9 \quad -9$
 $b \leq -7$

$b + 9 = 2$
 $-9 \quad -9$
 $b = -7$

3. $8 < r - 9$
 $+9 \quad +9$
 $17 < r$

$8 = r - 9$
 $+9 \quad +9$
 $17 = r$

4. $-4 < p + 4$
 $-4 \quad -4$
 $-8 < p$
 $p > -8$

$-4 < -6 + 4$
 $-4 < -2$

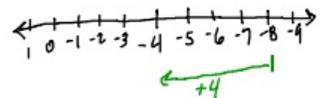
$-4 = p + 4$
 $-4 \quad -4$
 $-8 = p$

$-4 = -8 + 4$

Solve each inequality. Graph the solution set on a number line.

5. $s + 8 < 9$

6. $-3 \leq d - 2$



Lesson 6 Skills Practice

Solve Inequalities by Addition or Subtraction

Solve each inequality.

1. $a + 4 < 9$

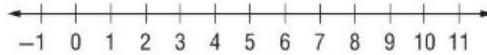
2. $e - 7 > 1$

5. $n - 9 \geq 5$

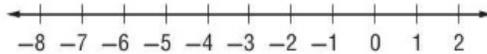
6. $-4 > h - 2$

Solve each inequality. Graph the solution set on a number line.

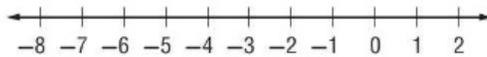
9. $8 < p - 1$



11. $1 > x + 6$



13. $b - 3 \leq -8$



Write an inequality and solve each problem.

15. Two less than a number is less than 9.

Two LESS THAN 10 is 8
 $n - 2 < 9$

$10 - 2 = 8$
 $n - 2 < 9$
 $+2$ $+2$
 $n < 11$

16. The difference between a number and 3 is no more than 2.

17. The sum of a number and 8 is more than 4.

18. Two more than a number is less than 13.

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