Warm UP:
Copy the sentences below. Leave one line between them.
Can you represent the situations mathematically?

- At least 18 people were at the party.
- The crowd was made up of no less than 80 people.
- The Super Bowl is viewed by more than one billion viewers every year.

Hint:

- > Greater Than < Less Than
- ≥ Greater Than or Equal to ≤ Less Than or Equal to

Solving Inequalities by Adding or Subtracting

Write the inequality for each situation.

1. There are at least 28 days in a month.

days in a month ≥ 28

2. The temperature is above 72°.

temperature $> 72°$

3. At most 9 passengers can ride in the van.

passengers ≤ 9

Solving Inequalities by Adding or Subtracting

Essential Question

How do you solve inequalities that involve one operation?

Standard

MCC7.EE.4: Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

How to video

Fold along bold black line.
Cut along the dotted lines.

INEQUALITIES

Less Than
<
	Greater Than
	  >
		Less Than or Equal To
		  ≤
			Greater Than or Equal
			  ≥

Represented on the number line with an open circle. ○	Represented on the number line with an open circle. ○	Represented on the number line with a closed circle. ●	Represented on the number line with a clo circle. ●

$x < 3$

$x > 3$

$x \leq 3$

$x \geq 3$

$x + 2 < 6$

$x - 5 > 1$

$2x + 1 \leq 11$

$3x + 4 + 3 \geq 19$

Solving Inequalities by Adding or Subtracting

Same as solving equations!!!!!!!!

Addition and Subtraction Properties of Inequality			
You can add or subtract the same number on both sides of an inequality, and the inequality will still be true.			
$3 < 5$ $3 + 2 < 5 + 2$ $5 < 7$	$6 > 2$ $6 - 1 > 2 - 1$ $5 > 1$	$4 \leq 7$ $4 + 3 \leq 7 + 3$ $7 \leq 10$	$0 \geq -3$ $0 - 4 \geq -3 - 4$ $-4 \geq -7$

Solving Inequalities by Adding or Subtracting

Additional Example 1A: Using the Addition Property of Inequality

Solve. Then graph the solution set on a number line.

$$n - 7 \leq 15$$

$$\begin{array}{rcl} n - 7 & \leq & 15 \\ +\ 7 & & +\ 7 \\ \hline n & \leq & 22 \end{array}$$

Add 7 to both sides.

Draw a closed circle at 22 then shade the line to the left of 22.

Additional Example 1B: Using the Addition Property of Inequality

Solve. Then graph the solution set on a number line.

$a - 10 \geq -3$

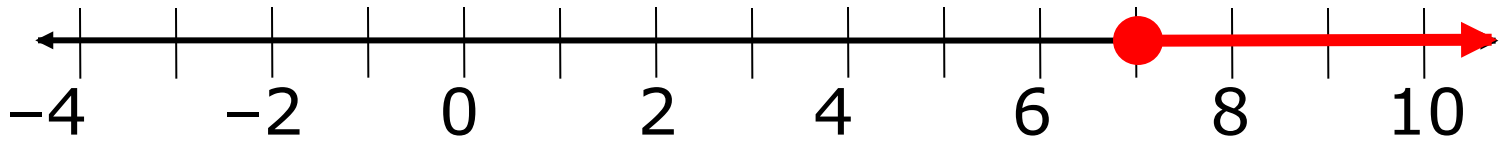
$a - 10 \geq -3$

$+ 10 \quad +10$

$a \geq 7$

Add 10 to both sides.

Draw a closed circle at 7. Then shade the line to the right.



Solving Inequalities by Adding or Subtracting

Check It Out: Example 1A

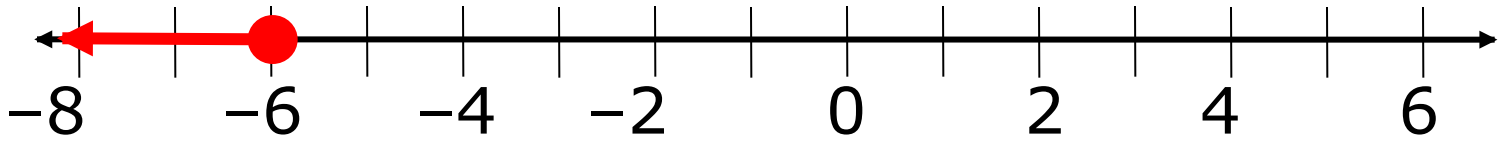
Solve. Then graph the solution set on a number line.

$$d - 12 \leq -18$$

$$\begin{array}{rcl} d - 12 & \leq & -18 \\ +\ 12 & & +\ 12 \\ \hline d & \leq & -6 \end{array}$$

Add 12 to both sides.

Draw a closed circle at –6 then shade the line to the left of –6.



Solving Inequalities by Adding or Subtracting

Check It Out: Example 1B

Solve. Then graph the solution set on a number line.

$b - 14 \geq -8$

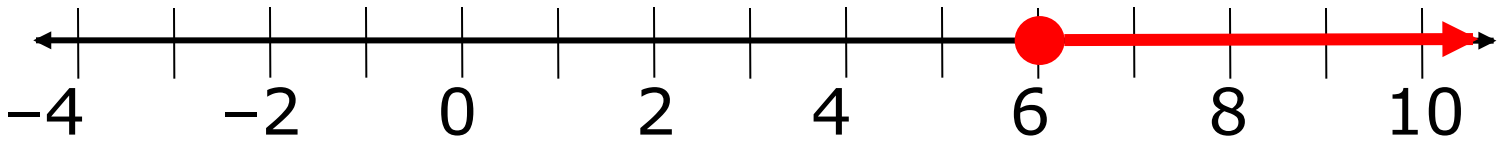
$b - 14 \geq -8$

$+ 14 \quad +14$

$b \geq 6$

Add 14 to both sides.

Draw a closed circle at 6. Then shade the line to the right.



Additional Example 2A: Using the Subtraction Property of Inequality

Solve. Check each answer.

$d + 11 > 6$

$d + 11 > 6$

$-11 \quad -11$

$d > -5$

Subtract 11 from both sides.

Check

$d + 11 > 6$

$0 + 11 \stackrel{?}{>} 6$

$11 \stackrel{?}{>} 6$ ✓

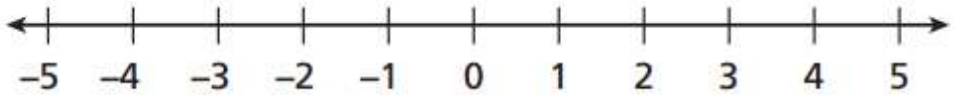
0 is greater than –5. Substitute 0 for d.

ACTICE

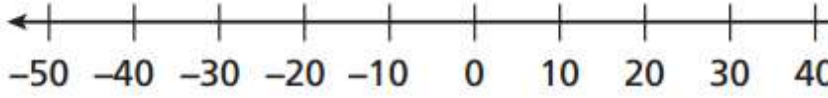
WB: Pg. 146

lve each inequality, and graph the solution set.

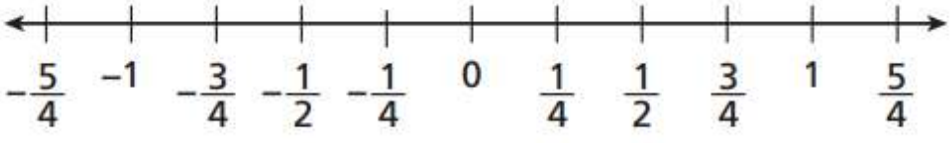
$x + 8 \geq 4$



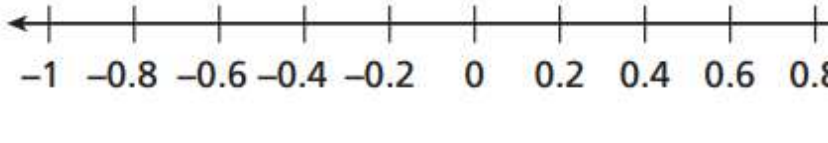
2. $t - 15 < 30$



$k + \frac{1}{4} > \frac{7}{8}$



4. $r - 0.2 \leq 0.6$



lve each inequality, and explain what the solution set means in the ntext of the situation.

At most, 47 passengers can sit on a bus. There are already 29 passengers seated on the b
The inequality $p + 29 \leq 47$ represents this situation, where p is the number of additiona

Solving Inequalities by Adding or Subtracting

Homework: Workbook Pg. 147 #1-6