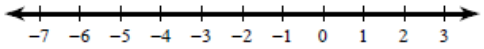
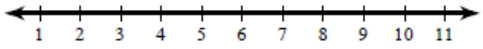
4B Warm-up 1-23

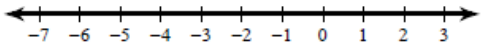
1. $167 < 6 + 7(2 - 7r)$



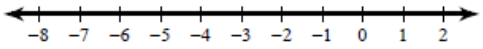
2. $5(6 + 3r) + 7 \geq 127$



3. $-8x + 2x - 16 < -5x + 7x$

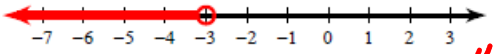


4. $-1 - 6x - 6 > -11 - 7x$



Warm-up Answers

1. $167 < 6 + 7(2 - 7r)$



$r < -3$

$167 < 6 + 14 - 49r$

$167 < 20 - 49r$

$-20 \quad -20$

$147 < -49r$

$-49 \quad -49$

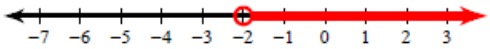
$-3 > x$

$x < -3$

2. $5(6 + 3r) + 7 \geq 127$

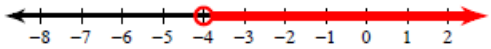
$r \geq 6$

3. $-8x + 2x - 16 < -5x + 7x$



$x > -2$

4. $-1 - 6x - 6 > -11 - 7x$



$x > -4$

Warm-up 10-4

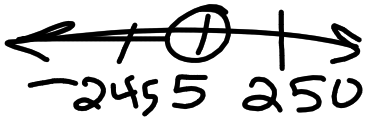
Solve the inequality and graph the solutions.

1. m + 7 > 11

$m > 4$

2. $\frac{11x}{11} < \frac{55}{11}$

$x < 5$

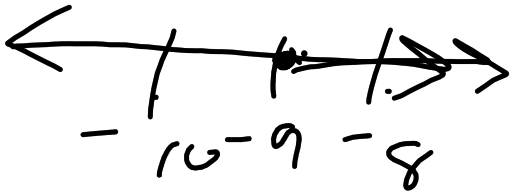


3. 34 < 16 + x

$18 < x$

4. $18 \geq -2v$

$v \geq -9$



Warm-up 11-4

Solve the inequality and graph the solutions.

1. m + 7 > 11

-7 -7

m > 4

2. 11x < 55

11 11

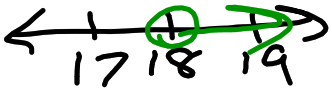
x < 5

3. 34 < 16 + x

-16 -16

18 < x

x > 18



4. 18 ≥ -2v

-2 -2

-9 ≤ v

v ≥ -9

$\frac{4x}{4} < \frac{-16}{4}$

$x < -4$

$(-3)\frac{-2}{-3}x > -6(-3)$

$\frac{-2x}{-2} < \frac{18}{-2}$

$x > .9$

$(-2)\frac{y}{-2} > 3(-2)$

$y < -6$

pg 115 #17

550

$80 per night

$\frac{80x}{80} \leq \frac{550}{80}$

$x \leq 6.875$

6 nights

550
-80
-80
-80
-80
-80
-80

$\frac{8x}{8} \leq \frac{-80}{8}$

$x \leq -10$

TODAY'S GOALS

I can...

- solve multi-step inequalities by using addition, subtraction, multiplication, and division.

SECTION 6.2: SOLVING INEQUALITIES

Solving inequalities is much like solving equations. To solve an inequality, you need to isolate the variable using the properties of inequality and inverse operations.

Properties of inequality

1. **Addition Property** $a + c < b + c$; $a + c > b + c$

2. **Subtraction Property** $a - c < b - c$; $a - c > b - c$

3. **Multiplication Property** $a*c < b*c$; $a*c > b*c$
    1. If c = positive
4. **Division Property** $a/c < b/c$; $a/c > b/c$
    1. If c = positive

Caution!

Do not change the direction of the inequality symbol just because you see a negative sign. For example, you do not change the symbol when solving $\frac{4x}{4} < \frac{-24}{4}$.

$x < -6$

Section 6.3: Solving Multi-Step Inequalities

Inequalities that contain more than one operation require more than one step to solve. Use inverse operations to undo the operations in the inequality one at a time.

Solve the inequality and graph the solutions

$45 + 2b > 61$

$-45 \quad -45$

$2b > 16$

$\frac{2b}{2} > \frac{16}{2}$

$b > 8$

To solve more complicated inequalities, you may first need to simplify the expressions on one or both sides by using the order of operations, combining like terms, or using the Distributive Property.

Solve the inequality.

2 – (–10) > –4*t*

$2+10>-4t$

$\frac{12}{-4} > \frac{-4t}{-4}$

$-3 < t$ $\quad t > -3$

–4(2 – *x*) ≤ 8

$\frac{-4}{-4} \quad \frac{8}{-4}$

$+2-x \geq -2$

$-2 \qquad -2$

$\frac{-x}{-1} \geq \frac{-4}{-1}$

$x \leq 4$

$-4(2-x) \leq 8$

$-8+4x \leq 8$

$+8 \qquad +8$

$\frac{4x}{4} \leq \frac{16}{4}$

$x \leq 4$

$(1/3)-(1/2)$

$\frac{2}{3}f + \frac{1}{2} > \frac{1}{3}$

$-\frac{1}{2} \quad -\frac{1}{2}$

$\frac{3}{2}\cdot\frac{2}{3}f > -\frac{1}{6}\left(\frac{3}{2}\right)$

$f > -\frac{1}{4}$

$(6)\frac{2}{3}f + (6)\frac{1}{2} > \frac{1}{3}(6)$

$4f + 3 > 2$

$-3 \quad -3$

$\frac{4f}{4} > \frac{-1}{4}$

$f > -\frac{1}{4}$

Solve the inequality and graph the solutions.

$3 + 2(x + 4) > 3$

Solve the inequality and graph the solutions.

$3 + 2(x + 4) > 3$

$3 + 2x + 8 > 3$

$2x + 11 > 3$

$-11 \quad -11$

$\frac{2x}{2} > \frac{-8}{2}$

$x > -4$

MORE PRACTICE...

Solve and graph the following.

1. $10 + 22 \geq -4x$

3. $-6x - 2 > 10$

2. $3x - 7 + 2x < 8$

MORE PRACTICE...

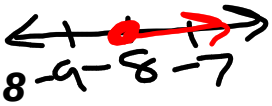
Solve and graph the following.

1. $10 + 22 \geq -4x$

$\frac{32}{-4} \geq \frac{-4x}{-4}$

$-8 \leq x$

$x \geq -8$



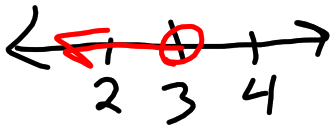
2. $3x - 7 + 2x < 8$

$5x - 7 < 8$

$+7 \quad +7$

$\frac{5x}{5} < \frac{15}{5}$

$x < 3$

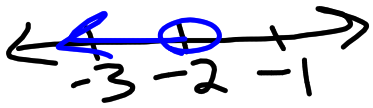


3. $-6x - 2 > 10$

$+2 \quad +2$

$\frac{-6x}{-6} > \frac{12}{-6}$

$x < -2$



$8 - 3y \geq 29$

$-12 \geq 3x + 6$

$\frac{x+5}{-2} > 3$

$\frac{1-2n}{3} \geq 7$

$8 - 3y \geq 29$

$-8 \quad -8$

$-3y \geq 21$

$\frac{-3y}{-3} \geq \frac{21}{-3}$

$y \leq -7$

$2\left(\frac{x+5}{-2}\right) > 3(-2)$

$x + 5 < -6$

$-5 \quad -5$

$x < -11$

$-12 \geq 3x + 6$

$-6 \quad -6$

$\frac{-18}{3} \geq \frac{3x}{3}$

$-6 \geq x$

$x \leq -6$

$3\left(\frac{1-2n}{3}\right) \geq 7(3)$

$1 - 2n \geq 21$

$-1 \quad -1$

$\frac{-2n}{-2} \geq \frac{20}{-2}$

$n \leq -10$

Solve each inequality and graph the solutions.

1. $13 - 2x \geq 21$

2. $-11 + 2 < 3p$

3. $2^3 < -2(3 - t)$

4. $\frac{1}{3}n + \frac{1}{2} < \frac{2}{3}$

Solve each inequality and graph the solutions.

1. $13 - 2x \geq 21$

$-13 \quad -13$

$-2x \geq 8$

$\frac{-2x}{-2} \geq \frac{8}{-2}$

$x \leq -4$

2. $-11 + 2p < 3p$

$-9 < 3p$

$\frac{-9}{3} < \frac{3p}{3}$

$-3 < p$

$p > -3$

3. $2^3 < -2(3 - t)$

$8 < -6 + 2t$

$+6 \quad +6$

$\frac{14}{2} < \frac{2t}{2}$

$7 < t$

$t > 7$

4. $\frac{1}{3}n + \frac{1}{2} < \frac{2}{3}$

$-\frac{1}{2} \quad -\frac{1}{2}$

$3 \cdot \frac{1}{3}n < \frac{1}{6} \cdot 3$

$n < \frac{1}{2}$

INEQUALITIES

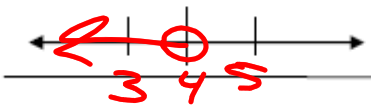
LESS THAN $<$	GREATER THAN $>$	LESS THAN OR EQUAL TO $\leq$	GREATER THAN OR EQUAL TO $\geq$
Represented on a number line with an open circle. ○	Represented on a number line with an open circle. ○	Represented on a number line with a closed circle. ●	Represented on a number line with a closed circle. ●

Inequalities Scavenger Hunt Answer Sheet Name:_____

Directions: Write the letter of the problem you are on. Solve the inequality in the space provided. Graph the answer on the number line provided. Finally, look for the answer on another station and repeat.

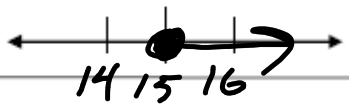
J
Letter

$x - 7 < -3$
$+7 \quad +7$
$x < 4$

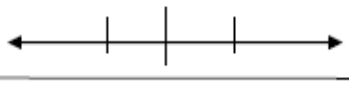


Q
Letter

$11 \leq -4 + x$
$+4 \quad +4$
$15 \leq x$
$x \geq 15$



M
Letter



Scavenger hunt!!

TODAY'S GOALS

I can...

- solve multi-step inequalities by using addition, subtraction, multiplication, and division.

THINK ABOUT THIS...

Directions: *Choose the task below that best demonstrates your comfort level.*

Level 1	Level 2	Level 3
Solve and graph the following inequality. $-3x + 4 \geq 40$	Solve and graph the following inequality. $7x + 4 < 22 - 2x$	Solve and graph the following inequality. $2(x + 3) \leq 3x - 13$

Before you choose the level you wish to solve, consider and answer these questions:

1.) Can you determine what makes each level a little harder?

2.) What skills and content knowledge are needed to complete each level?

3.) What level do you think will work best for you and why?

Homework

pg. 123 # 1-15 (odd), 37