2-1 Solving Inequalities

Objectives: I can solve single variable inequalities
I can graph an inequality on a number line

Vocabulary

Less than: $x < $

Greater than: $x > $

Less than or equal to: $x \leq$

Greater than or equal to: $x \geq$

Not equal to: $\neq$

Equal: $=$

Solution set: all #'s that satisfy a given condition

Inequality vocabulary and symbols:

$=$ equal

$\neq$ not equal

$x <$ less than ○

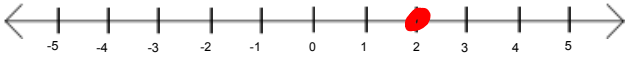
$x >$ greater than ○

$x \leq$ less or equal ●

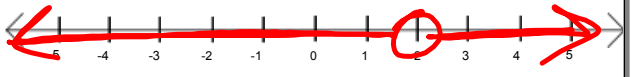
$x \geq$ greater or equal ●

Graphing inequalities on a number line:

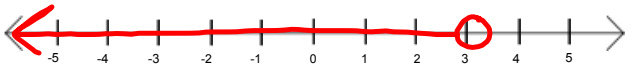
$x = 2$



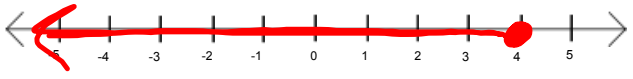
$x \neq 2$



$x < 3$

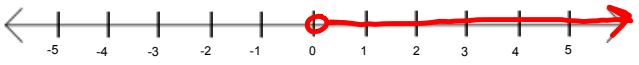


$x \leq 4$

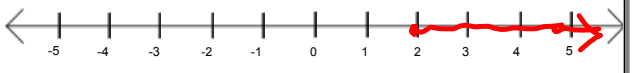


Graphing inequalities on a number line:

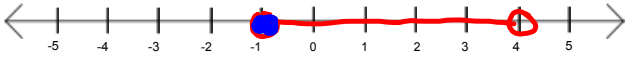
$x > 0$



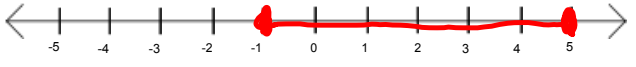
$x \geq 2$



$-1 \leq x < 4$



$-1 \leq x \leq 5$

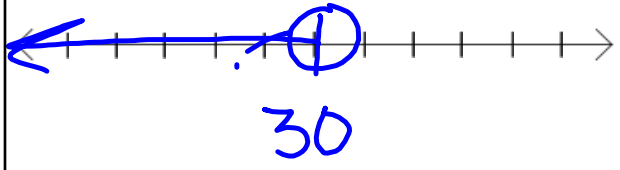


Solve and graph the following inequalities:

$22 > m - 8$

$+8 \quad +8$

$30 > m$



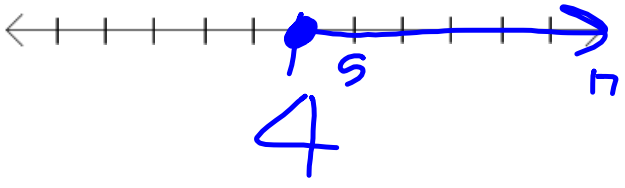
$3a + 6 \leq 4a + 2$

$-3a \quad -3a$

$6 \leq a + 2$

$-2 \quad -2$

$4 \leq a$



Answer the following with a partner:

1. Multiply both sides of the following inequality by 3. Is the new inequality still a true statement?

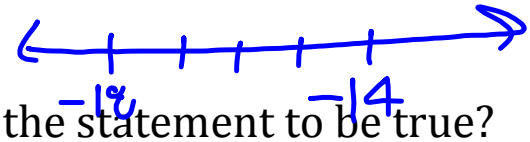
$4 > 2$

$12 > 6$ yes

2. Multiply both sides of the following inequality by -2. Is the new inequality still a true statement? No

$7 < 9$

$-14 < -18$



3. What needs to change for the statement to be true?

Switch Sign

$-14 > -18$

Multiplying or dividing an inequality by a negative number:

FLIP THE SIGN!

$$\frac{-3x}{-3} < \frac{6}{-3} \qquad \frac{5x}{5} < \frac{-10}{5}$$

$$x > -2 \qquad x < -2$$

Solve each of the following inequalities and graph the solution.

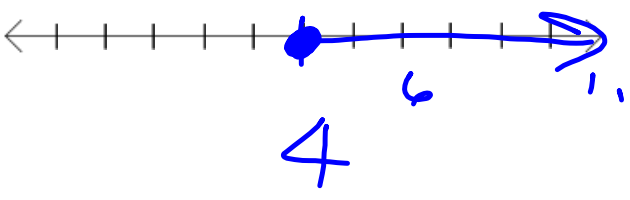
$-28 \geq -7x$

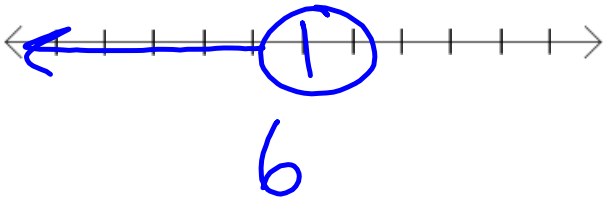
$\frac{-7}{-7} \quad \frac{-7x}{-7}$

$4 \leq x$

$\cdot\frac{3}{4}\left(-\frac{4}{3}p\right) > -8 \cdot \frac{3}{4}$

$p < 6$





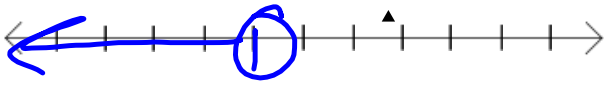
Solve each of the following inequalities and graph the solution.

$-11y-13>42$

$+13 \quad +13$

$\frac{-11y}{-11} > \frac{55}{-11}$

$y < -5$



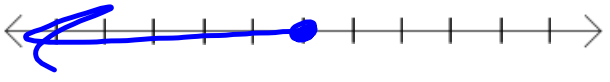
-5

$13-11d \geq 79$

$-13 \quad -13$

$\frac{-11d}{-11} \geq \frac{66}{-11}$

$d \leq -6$



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Solve each of the following inequalities and graph the solution.

$4(3t-5)+7 \geq 8t+3$

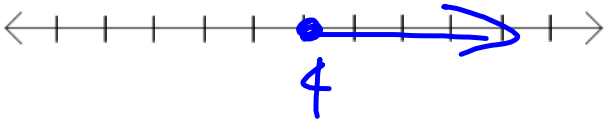
$12t - 20 + 7 \geq 8t + 3$

$12t - 13 \geq 8t + 3$

$+13 \quad +13$

$12t \geq 8t + 16$

$-8t \quad -8t$



4

$\frac{4t}{4} \geq \frac{16}{4}$

$t \geq 4$

$6(5z-3) \leq 36z$

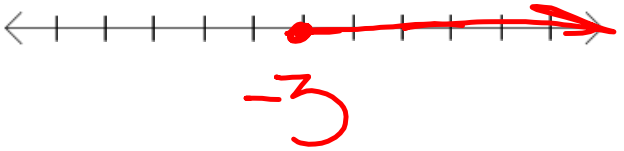
$30z - 18 \leq 36z$

$-30z \quad -30z$

$-18 \leq 6z$

$\frac{-18}{6} \leq \frac{6z}{6}$

$-3 \leq z$



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Write and solve the inequalities:

a)five minus six times a number is more than four times the number plus 45

$5 - 6x > 4x + 45$

$+6x \quad +6x$

$5 > 10x + 45$

b) two more than half of a number is greater than twenty-seven

$2 + \frac{1}{2}x > 27$

$-2 \quad -2$

$\frac{2}{1} \cdot \frac{1}{2}x > 25 \cdot \frac{2}{1}$

$x > 50$

A basketball player's goal was to score at least 150 points this season. So far, she has scored 123 points. If there is one game left, how many points must she score to reach her goal?

Scored goal

$123 + x \geq 150$

$x \geq 27$

27 points

Mario purchases a prepaid phone plan for $50 at $0.13 per minute. How many minutes can Mario talk on this plan?

Write an solve an inequality to find the sales Mrs. Jones needs if she earns a monthly salary of $2000 plus a 10% commission on her sales. Her goal is to make at least $4000 per month. What sales does she need to meet her goal?