

## Warmup

Solve the following

$$1) 4(2x - 7) = 6x + 4$$

$$8x - 28 = 6x + 4$$

$+28$                        $+28$

$$8x = 6x + 32$$

$-6x$      $-6x$

$$\frac{2x}{2} = \frac{32}{2} \quad \boxed{x=16}$$

2) solve for a

$$4a + 4b = c$$

$$\cdot -4b$$

$$\frac{4a}{4} = \frac{c - 4b}{4}$$

$$A = \frac{c - 4b}{4}$$

$$A = \frac{c}{4} - b$$

$y >$  Greater than

$y = mx + b$   
b - y-intercept  
slope: m

less than  $y <$

- Dashed line (not equal)
- Shade above the line *shade up*

- Dashed line (not equal)
- Shade below the line *shade down*

Example:  $y > \frac{1}{2}x + 3$

Slope:  $\frac{1}{2}$

y-int: 3

works

(0,5)  
(-3,4)

Don't work

(0,0)  
(0,3)

Example:  $y < -3x + 4$

Slope:  $-3$

y-int: 4

work

(0,0)  
(2,0)

Don't

(5,0)  
(9,10)

Linear Inequalities

\*Remember  $y = mx + b$

$y \geq$  Greater than OR equal to

less than OR equal to  $y \leq$

- Solid line
- Shade above the line *shade up*

- Solid line
- Shade below the line *shade down*

Example:  $\frac{2y \geq -2x - 4}{2 \quad 2 \quad 2}$

$y \geq -x - 2$

Slope:  $-\frac{1}{1}$

y-int: -2

work

(0,0)  
(7,0)

Don't

(-10,-10)  
(-2,-5)

\*Divide by negative, symbol flips\*

Example:  $4x - 3y \geq -12$

~~$-4x$~~   $-4x$

~~$-3y$~~   $-3y \geq -4x - 12$

~~$-3$~~   $\frac{-3y}{-3} \geq \frac{-4x - 12}{-3}$

$y \leq \frac{4}{3}x + 4$

Slope:  $\frac{4}{3}$

y-int: 4

work

(0,0)  
(0,-7)

Don't

(-5,4)  
(-5,0)

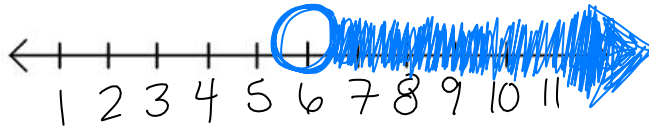
Solving Basic Inequalities and Graphing on a number line

$$4x - 10 > 14$$

$$+10 +10$$

$$\cancel{4x} > \cancel{24}$$

$$\frac{x}{4} > \frac{24}{4}$$



$(6, \infty)$

greater than  
Right

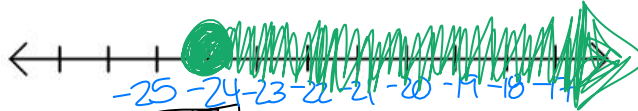
$$-\frac{m}{3} - 5 \leq 3$$

$$+5 +5$$

$$-\frac{m}{3} \leq 8$$

$$\cdot 3 \cdot 3$$

$$-m \leq 24$$



$[-24, \infty)$

$$-9 \geq 4m - 7$$

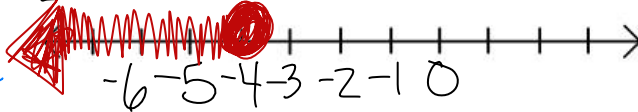
$$+7 +7$$

$$-16 \geq 4m$$

$$\div 4 \div 4$$

$$-4 \geq m$$

$$m \leq -4$$



$(-\infty, -4]$

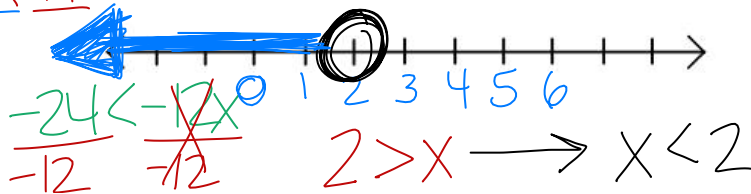
$$12 < -5(2x - 7) - 2x + 1$$

$$12 < -10x + 35 - 2x + 1$$

$$12 < -12x + 36$$

$$-36 -36$$

$$-24 < -12x$$

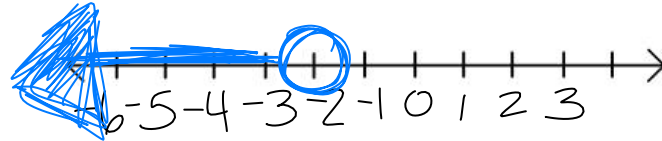


$(-\infty, 2)$

$$-\frac{4x-7}{7} > \frac{1}{7}$$

$$-4x - 7 > 1$$

$$+7 +7$$



$(-\infty, -2)$

$$\cancel{-4x} > \cancel{8}$$

$$\cancel{-4} \quad \cancel{-4}$$

$$x < -2$$