

Warmup

Solve the following

$$1) 2c = 4(a+b) \text{ for}$$

$$2c = 4a + 4b$$

~~-4b~~ ~~-4b~~

$$\frac{2c - 4b}{4} = \frac{4a}{4}$$

$$\frac{1}{2}c - b = a \quad \text{OR} \quad \frac{c - 2b}{2} \quad \text{OR} \quad \frac{c}{2} - b$$

$$2) \frac{7+4x}{3} - 12 = -3$$

~~+12~~ +12

$$3 \cdot \frac{7+4x}{3} = 9 \cdot 3$$

$$\frac{7+4x}{-7} = \frac{27}{-7}$$

$$\frac{4x}{4} = \frac{20}{4}$$

$$x = 5$$

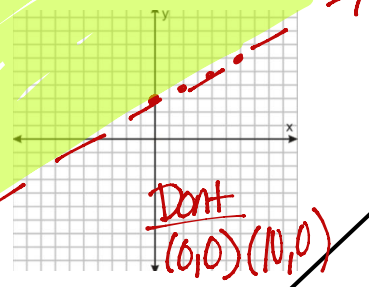
$y >$ → Greater than

- Dashed line
- Shade above the line **Shade up**

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

Slope: $\frac{1}{2}$
y-int: 3

Work
(0,5)
(1,10)



Don't
(0,0) (10,0)

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

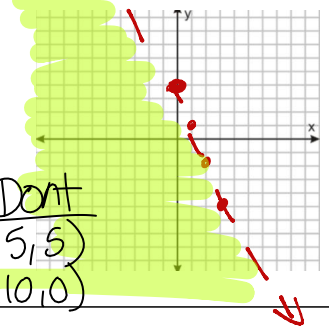
less than $y <$

- Dashed line
- Shade below the line **Shade down**

Example: $y < -3x + 4$

Slope: -3
y-int: 4

Work
(-1,-1)
(0,0)



Don't
(5,5)
(10,0)

Linear Inequalities

*Remember $y = mx + b$

$y \geq$ → greater than OR equal to

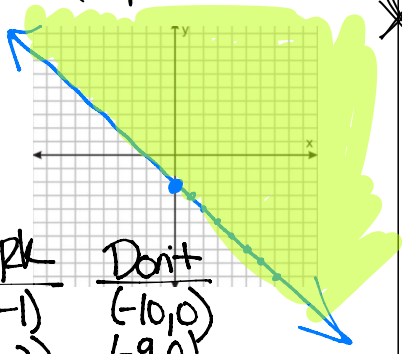
- Solid line
- Shade above the line **Shade up**

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

$y \geq -x - 2$

Slope: $-\frac{1}{1}$
y-int: -2

Work
(1,-1)
(0,-2)
Don't
(-10,0)
(-9,0)



less than OR equal to $y \leq$

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

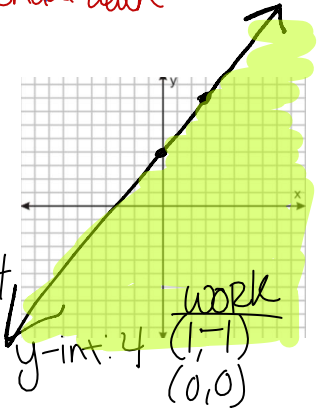
Example: $4y - 3y \geq -12$

~~Divide~~ OR Multiply by negative, Flip symbols

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

Don't
(-5,5)
(-10,0)

$y \leq \frac{4}{3}x + 4$
Slope: $\frac{4}{3}$ y-int: 4
Work
(1,-1)
(0,0)



Solving Basic Inequalities and Graphing on a number line

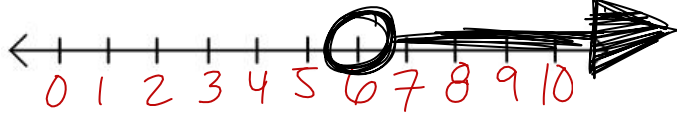
$$4x - 10 > 14$$

$$+10 +10$$

$$4x > 24$$

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

$$x > 6$$



$$(6, \infty)$$

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

$$+5 +5$$

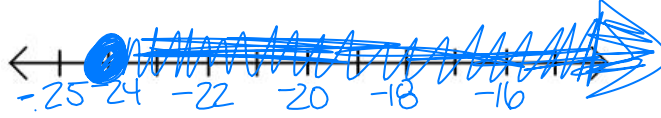
$$-\frac{m}{3} \leq 8$$

$$\cdot 3 \cdot 3$$

$$-m \leq 24$$

$$\frac{-m}{-1} \leq \frac{24}{-1}$$

$$m \geq -24$$



$$[-24, \infty)$$

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

$$-7 -7$$

$$-16 \geq 4m$$

$$\frac{-16}{4} \geq \frac{4m}{4}$$



$$(-\infty, -4]$$

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

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

$$12 < -12x + 36$$

$$-36 -36$$

$$-24 < -12x$$

$$\frac{-24}{-12} < \frac{-12x}{-12}$$

$$2 > x \rightarrow x < 2$$



$$(-\infty, 2)$$

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

$$+7 +7$$

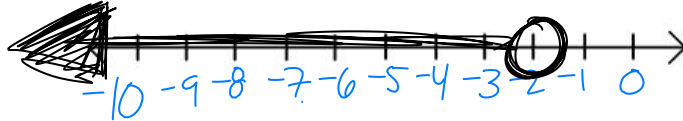
$$-4x - 7 > 1$$

$$+7 +7$$

$$-4x > 8$$

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

$$x < -2$$



$$(-\infty, -2)$$