

## 2.6 LINEAR INEQUALITIES IN TWO VARIABLES

The differences between graphing linear equations and linear inequalities are the type of line used and the shading.

<u>Inequality</u>	<u>Type of Line</u>	<u>Where to Shade</u>
$<$	dashed	below y-int
$\leq$	solid	below y-int
$\geq$	solid	above y-int
$>$	dashed	above y-int

An ordered pair is a Solution of a linear inequality if the inequality is true when the values for  $x$  and  $y$  are plugged in.

### Example 1

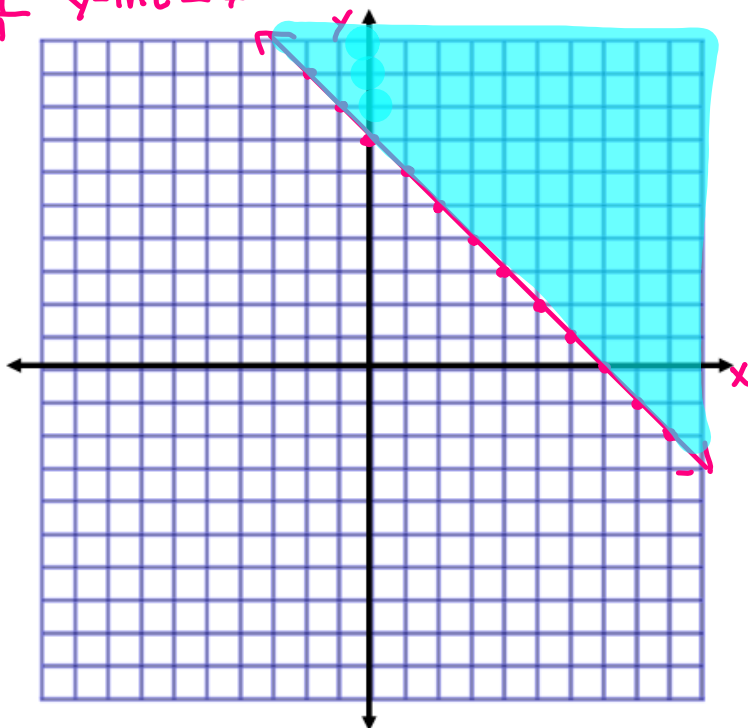
Check whether the given ordered pairs are solutions of  $2x + 3y \geq 5$ .

a)  $(0, 1)$   $\leftarrow$  not a solution  
 $2(0) + 3(1) \geq 5$   
 $0 + 3 \geq 5$   
 $3 \not\geq 5$

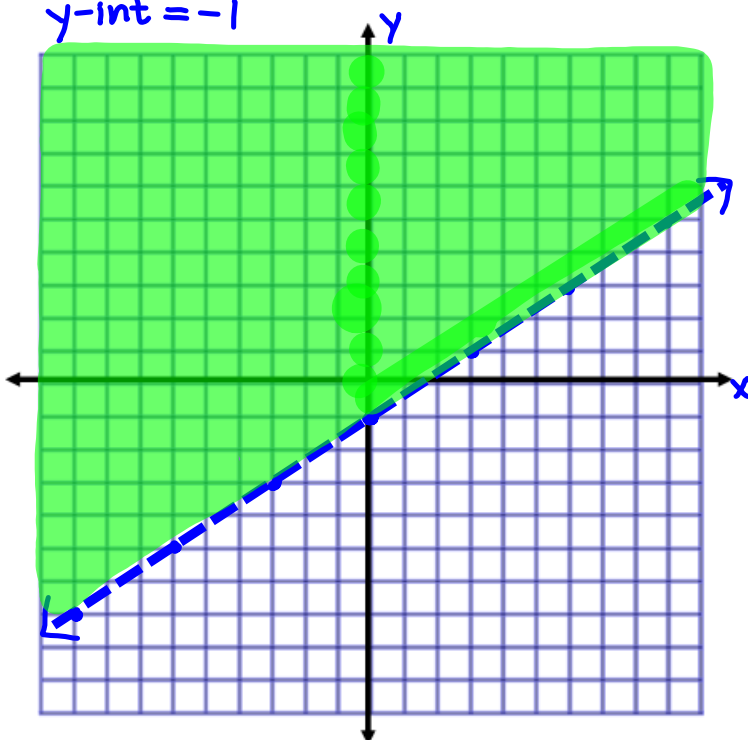
b)  $(4, -1)$   $\leftarrow$  solution  
 $2(4) + 3(-1) \geq 5$   
 $8 + -3 \geq 5$   
 $5 \geq 5 \checkmark$

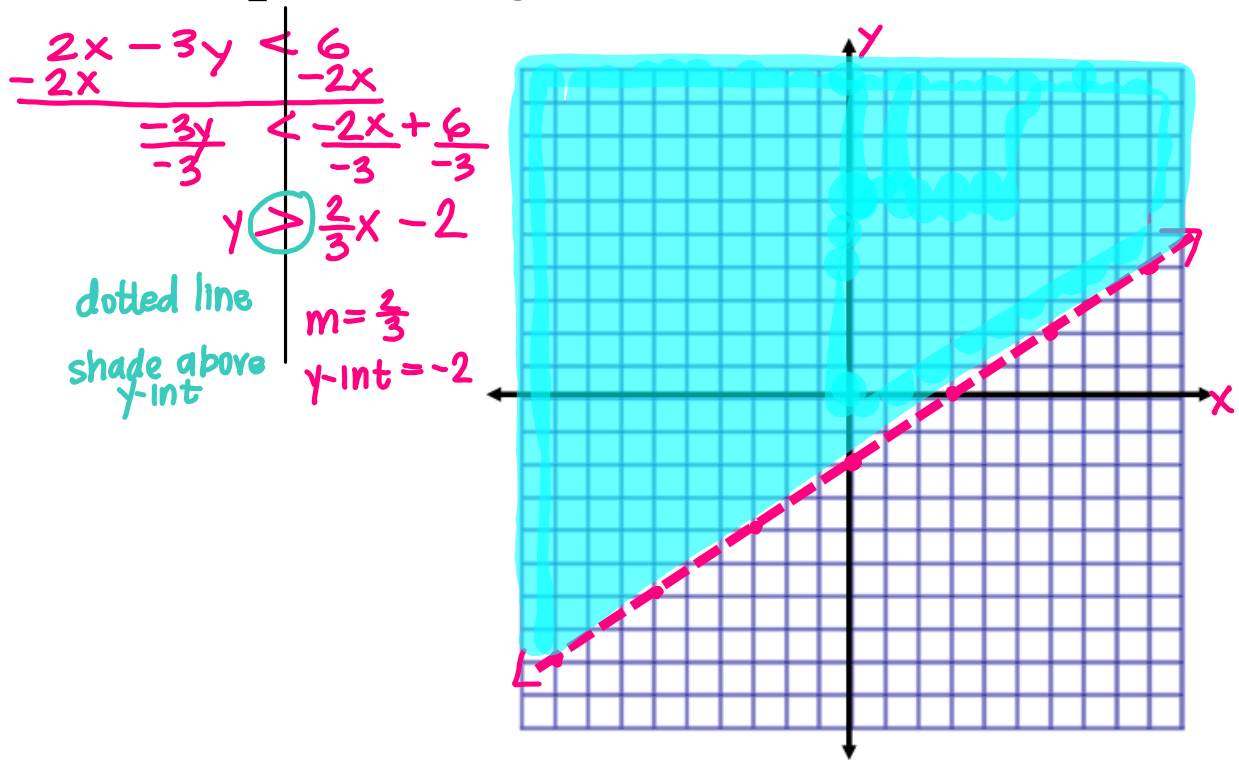
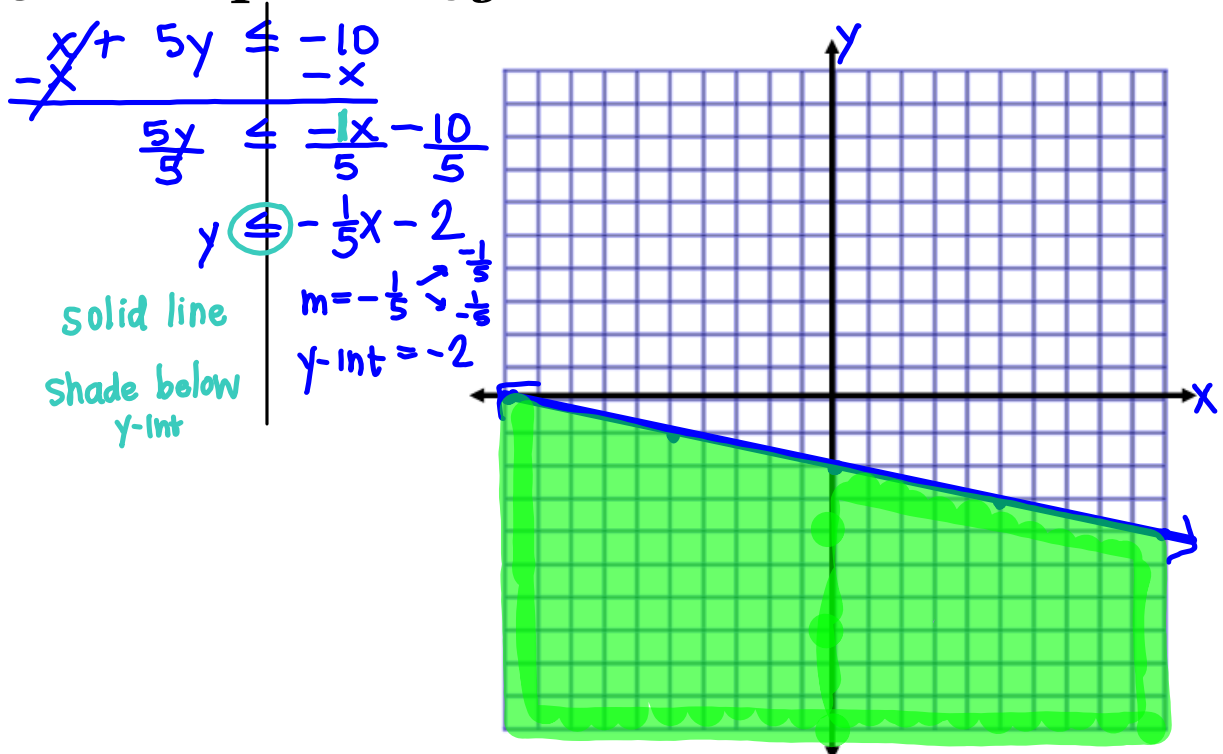
c)  $(2, 1)$   $\leftarrow$  solution  
 $2(2) + 3(1) \geq 5$   
 $4 + 3 \geq 5$   
 $7 \geq 5 \checkmark$

2. Graph  $y \geq -x + 7$ .  
solid line & shade above y-int  
 $m = -1$  y-int = 7



3. Graph  $y > \frac{2}{3}x - 1$ .  
dashed line and shade above y-int  
 $m = \frac{2}{3}$  y-int = -1

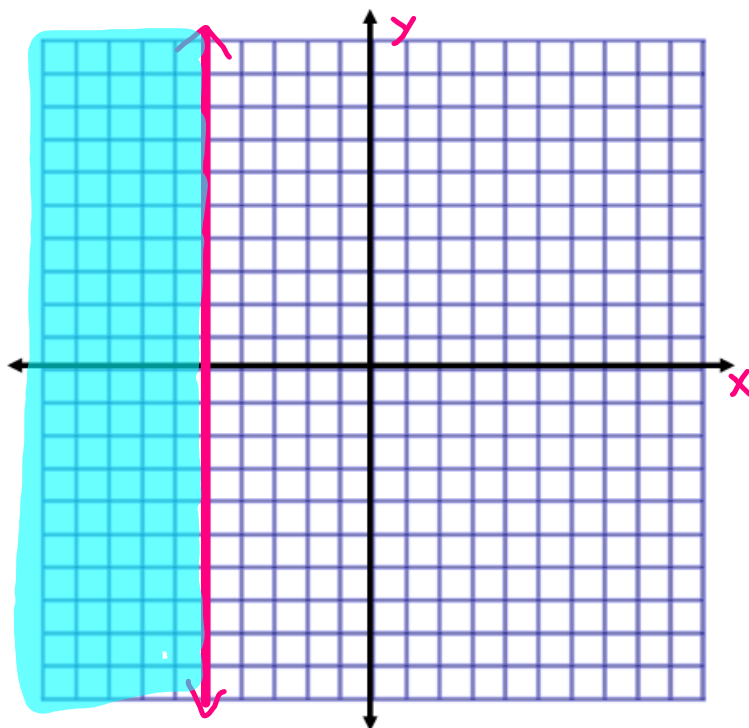


4. Graph  $2x - 3y < 6$ .5. Graph  $x + 5y \leq -10$ .

6. Graph  $-x \geq 5$ .

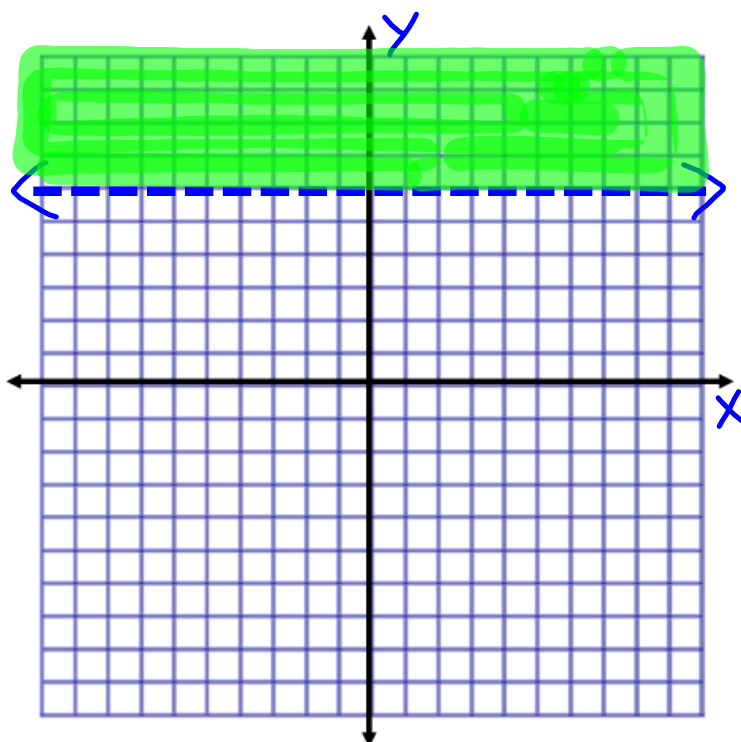
$$\frac{-x}{-1} \geq \frac{5}{-1}$$
$$x \leq -5$$

vert. line  
solid line  
shade left



7. Graph  $y > 6$ .

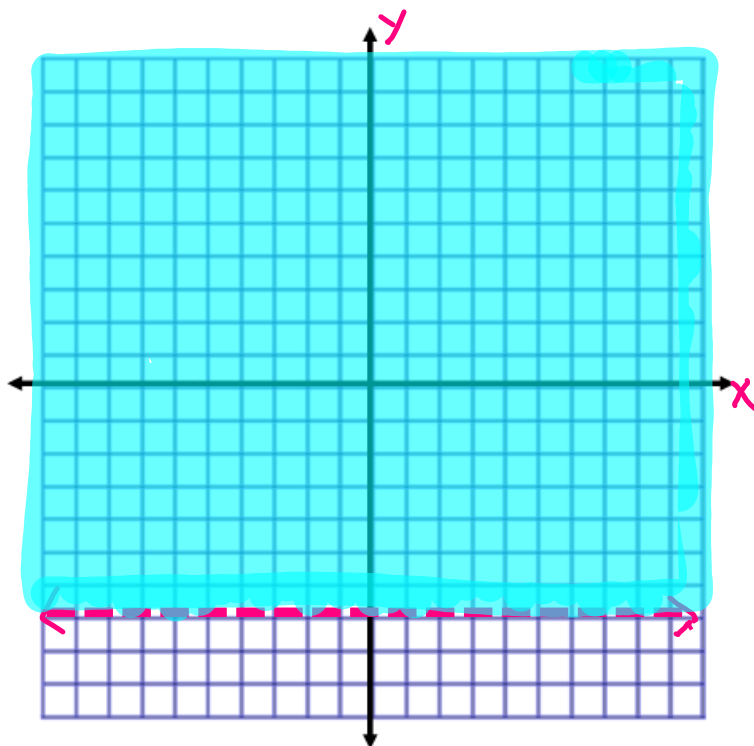
horizontal line  
dashed line  
shade above



8. Graph  $-3y < 21$ .

$$\frac{-3y}{-3} < \frac{21}{-3}$$
$$y > -7$$

hor. line  
dotted/dashed  
shade above



9. Graph  $x \leq \frac{1}{2}$ .

solid  
vertical  
shade  
left

