

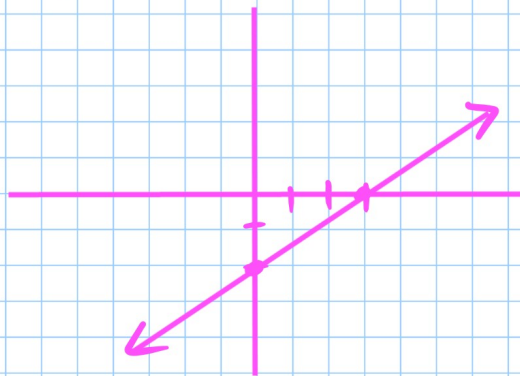
WARMUP

Graph

$$1) y = \frac{2}{3}x - 2$$

x	y
0	-2
3	0

$\frac{2}{3} \cdot 0 - 2 = 0 - 2$
 $\frac{2}{3} \cdot 3 - 2 = 2 - 2 = 0$



$$2) 3x + 2y = 6$$

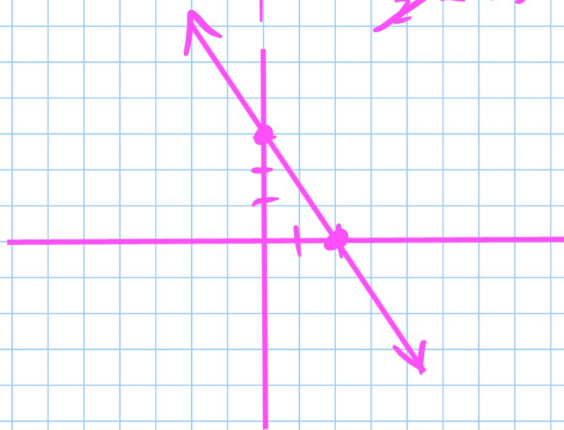
$$\begin{array}{r} \cancel{3x} + 2y = 6 \\ \hline \phantom{\cancel{3x}} - 3x \end{array}$$

$$\cancel{\frac{2}{2}}y = \frac{-3x}{2} + \frac{6}{2}$$

$$y = -\frac{3}{2}x + 3$$

x	y
0	3
2	0

$-\frac{3}{2} \cdot 0 + 3 = 0 + 3$
 $-\frac{3}{2} \cdot 2 + 3 = -3 + 3$



Section 9.4 Linear Inequalities in Two Variables

ex: $2x - 3y \geq 6$

STEP 1: Graph the corresponding equation.

Use a solid line for \geq or \leq and a dashed line for $<$ or $>$.

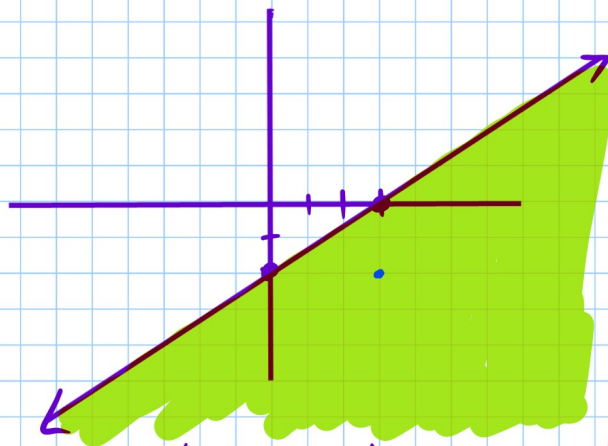
$$\begin{array}{r} 2x - 3y = 6 \\ \hline \cancel{2x} - 3y = 6 \\ \phantom{\cancel{2x}} - 3y = -2x + 6 \end{array}$$

$$\frac{-3y}{-3} = \frac{-2x + 6}{-3}$$

$$y = \frac{2}{3}x - 2$$

x	y
0	-2
3	0

$\frac{2}{3} \cdot 0 - 2$
 $\frac{2}{3} \cdot 3 - 2$



STEP 2: Choose a test point in one of the half-planes (it can't be on the line). Test it to see if it works in the inequality.

$$\begin{aligned} \text{Test } (0,0) \quad 2x - 3y &\geq 6 \\ 2 \cdot 0 - 3 \cdot 0 &\geq 6 \\ 0 - 0 &\geq 6 \\ 0 &\geq 6 \quad \text{FALSE!} \end{aligned}$$

STEP 3: If your test point yields a true inequality, shade the region that has the test point. If your test point yields a false inequality, shade the region that doesn't have the test point.

ex: $4x - 2y \geq 8$

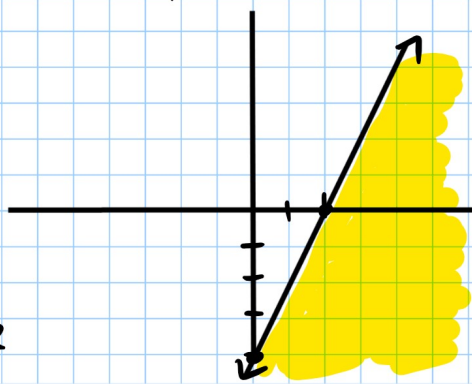
$$\begin{array}{r} 4x - 2y \geq 8 \\ -4x \qquad -4x \\ \hline \end{array}$$

$$\begin{array}{r} -2y = -4x + 8 \\ -2 \qquad -2 \end{array}$$

$$y = 2x - 4$$

$$\begin{aligned} \text{Test } (0,0) \\ 4 \cdot 0 - 2 \cdot 0 &\geq 8 \\ 0 - 0 &\geq 8 \quad \text{False} \end{aligned}$$

x	y	
0	-4	$2 \cdot 0 - 4$
2	0	$2 \cdot 2 - 4$

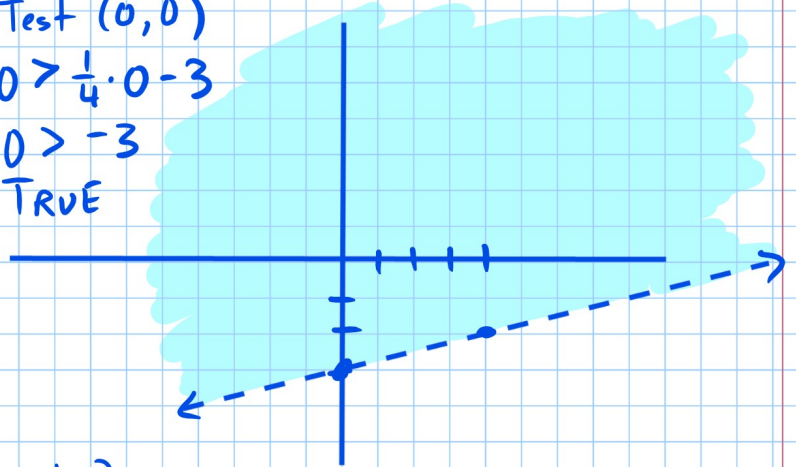


ex: $y > \frac{1}{4}x - 3$

$$y = \frac{1}{4}x - 3$$

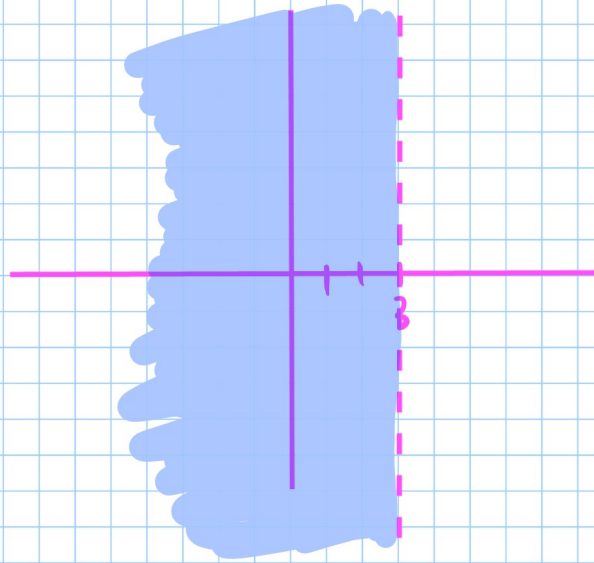
x	y	
0	-3	$\frac{1}{4} \cdot 0 - 3$
4	-2	$\frac{1}{4} \cdot 4 - 3 = 1 - 3$

Test (0,0)
 $0 > \frac{1}{4} \cdot 0 - 3$
 $0 > -3$
TRUE



ex: $x < 3$

$x = 3$
is a vertical
line



p648 3-17 odd

Hint on #9: multiply through by 6 first