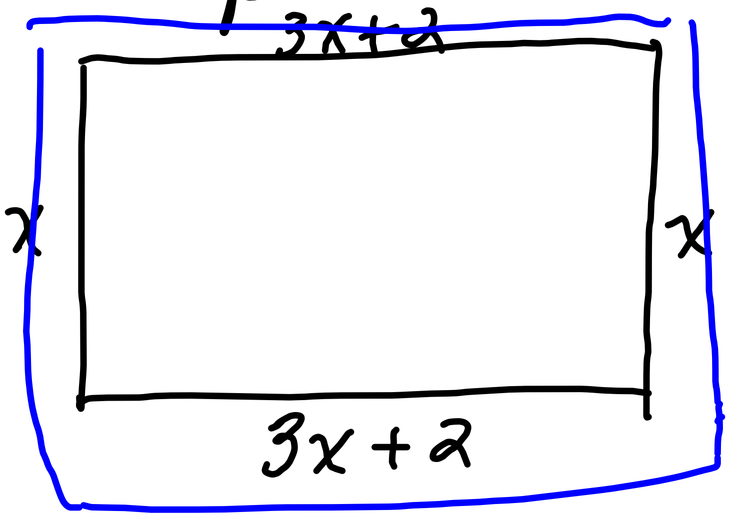
#1 Salmon

let $x$ = the width

perimeter = 44 inches




$P = 2l + 2w$

$44 = 2(3x+2) + 2x$

#9 Find two consecutive integers such that five times the larger number is 21 more than the smaller number.

let $x$ = the smaller integer

$x+1$ = The larger integer

$5(x+1) = x + 21$

#2 reserved \$20/person
general admiss \$12/person
total revenue \$4000

let $x$ = the number of reserved tickets.
$x+40$ = the # of general admission

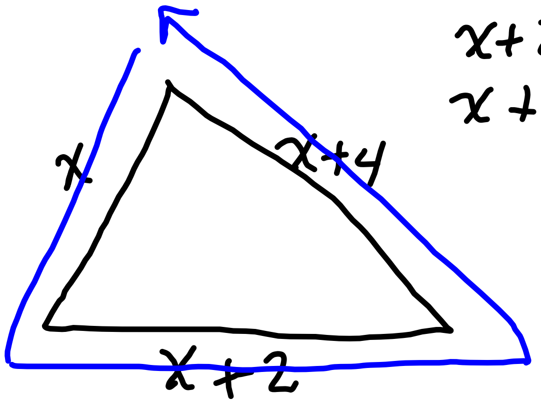
| | # | price | total revenue |
|---|---|---|---|
| reserved | $x$ | 20 | $20x$ |
| general | $x+40$ | 12 | $12(x+40)$ |
| total | | | 4000 |

$$20x + 12(x+40) = 4000$$

#3 let $x$ = the first number
$5x$ = the second number

$$x + 5x = 54$$
$$6x = 54$$

#8 triangle P = 42 feet
let $x$ = the shortest side
$x+2$ = The next side
$x+4$ = The longest side




$$42 = x + x+2 + x+4$$
$$42 = 3x + 6$$
$$-6 \quad\quad -6$$
$$\frac{36}{3} = \frac{3x}{3}$$
$$12 = x$$
$$14 = x+2$$
$$16 = x+4$$

Complete the table

3.4 31

| Equation | x-int | y-int |
|---|---|---|
| $3x + 4y = 12$ | $(4, 0)$ | $(0, 3)$ |
| $3x + 4y = 4$ | $(\frac{4}{3}, 0)$ | $(0, 1)$ |
| $3x + 4y = 3$ | $(1, 0)$ | $(0, \frac{3}{4})$ |
| $3x + 4y = 2$ | $(\frac{2}{3}, 0)$ | $(0, \frac{1}{2})$ |

x-int let $y = 0$

$\frac{3x}{3} = \frac{12}{3}$ $\qquad$ $\frac{3x}{3} = \frac{4}{3}$ $\qquad$ $\frac{3x}{3} = \frac{3}{3}$ $\qquad$ $\frac{3x}{3} = \frac{2}{3}$

$x = 4$ $\qquad$ $x = \frac{4}{3}$ $\qquad$ $x = 1$ $\qquad$ $x = \frac{2}{3}$

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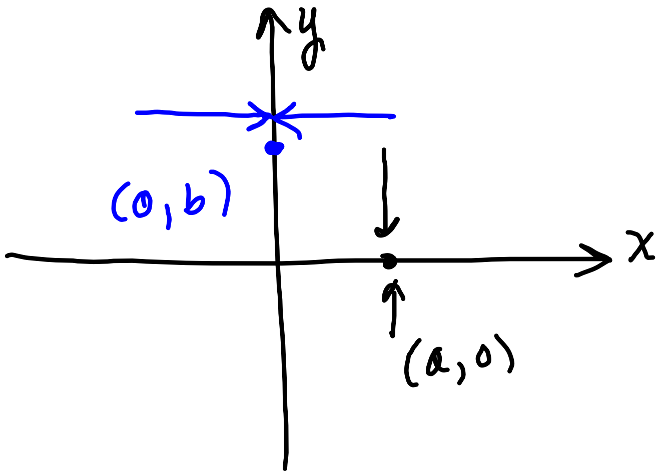
y-int let $x = 0$

$\frac{4y}{4} = \frac{12}{4}$ $\qquad$ $\frac{4y}{4} = \frac{4}{4}$ $\qquad$ $\frac{4y}{4} = \frac{3}{4}$ $\qquad$ $\frac{4y}{4} = \frac{2}{4}$

$y = 3$ $\qquad$ $y = 1$ $\qquad$ $y = \frac{3}{4}$ $\qquad$ $y = \frac{1}{2}$




35b Find x-intercept: $\left(-\frac{3}{2}, 0\right)$

$y=0$

$$2x - 3y = -3$$
$$2x - 3(0) = -3$$
$$\frac{2x}{2} = \frac{-3}{2}$$
$$x = \frac{-3}{2}$$

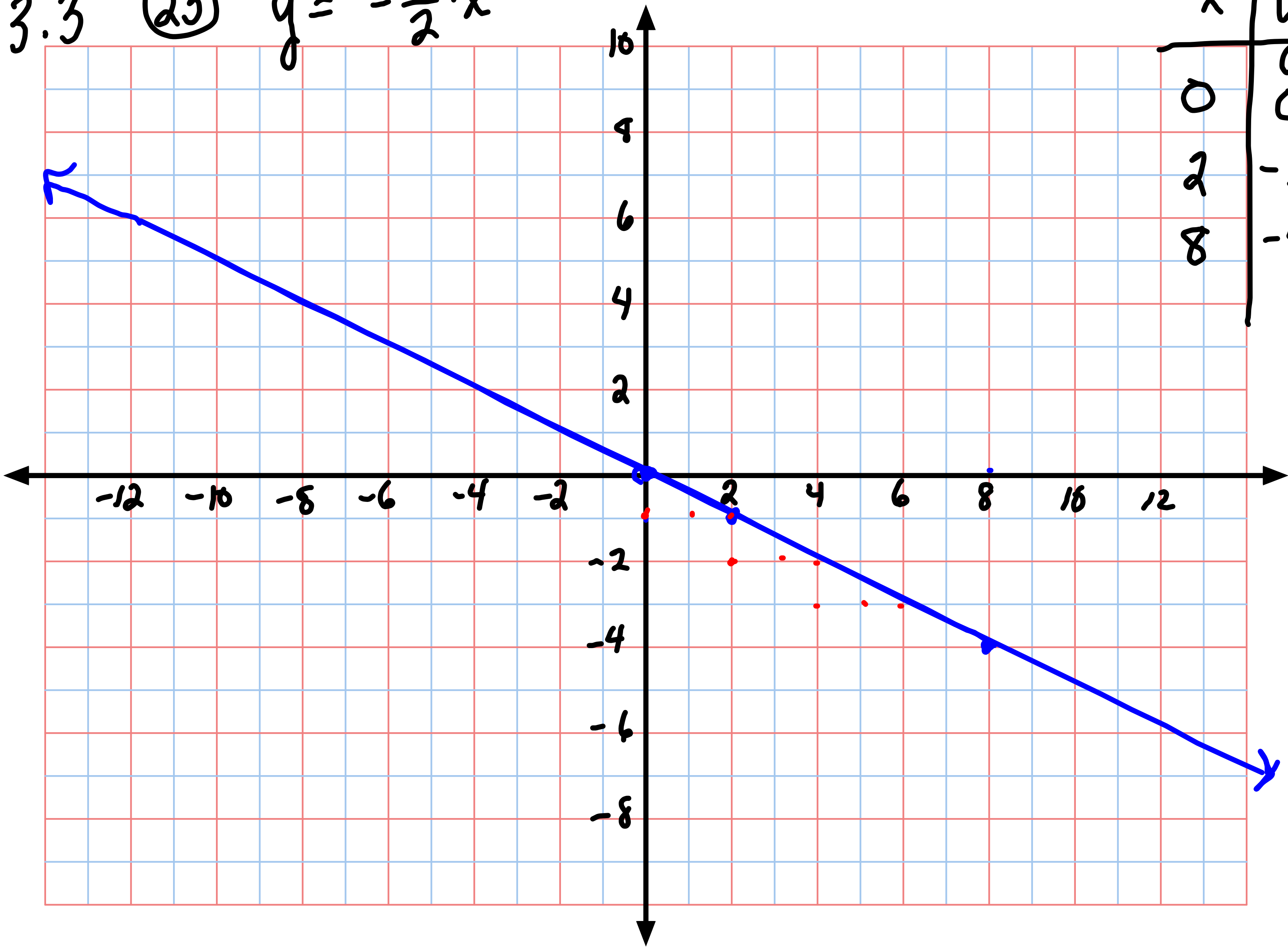
$$2x - 3y = -3$$
$$-2x \qquad\qquad -2x$$
$$\frac{-3y}{-3} = \frac{-2x - 3}{-3}$$
$$y = \frac{2}{3}x + 1$$

$x = 3$ $\quad y = \frac{2}{3}(3) + 1$

$$y = 2 + 1$$
$$y = 3$$
$$(3, 3)$$

3.3 23 $y = -\frac{1}{2}x$

| $x$ | $y$ |
| --- | --- |
| 0 | 0 |
| 2 | -1 |
| 8 | -4 |



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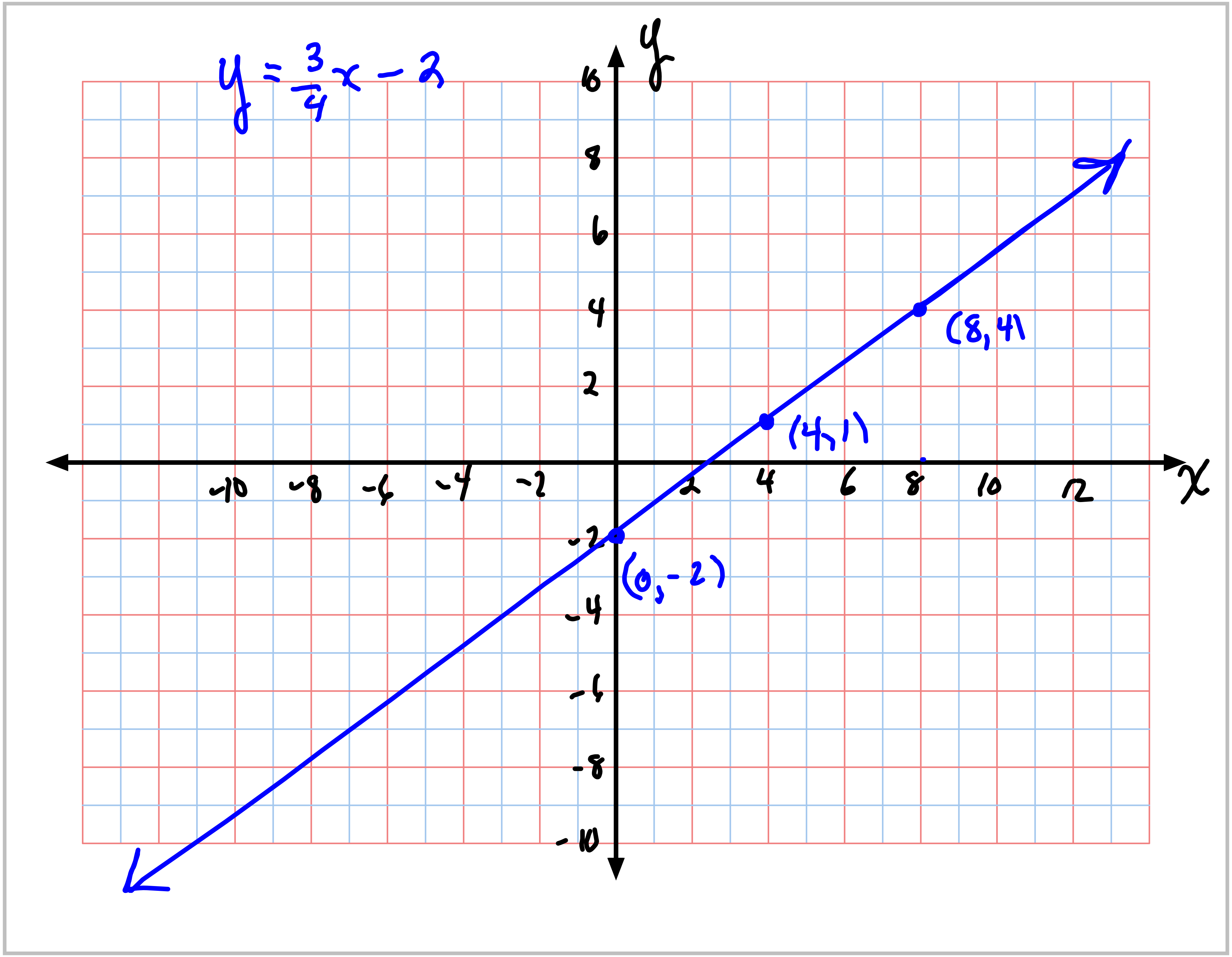
$$3x - 4y = 8$$
$$-3x \qquad\quad -3x$$
$$\frac{-4y}{-4} = \frac{-3x+8}{-4}$$
$$y = \frac{3}{4}x - 2$$

slope intercept

$$y = \frac{3}{\cancel{4}_1}(\cancel{4}^1) - 2$$
$$= 3-2$$
$$= 1$$
$$y = \frac{3}{\cancel{4}_1}(\cancel{8}^2) - 2$$
$$= 6-2$$
$$= 4$$

| x | y |
|---|---|
| 0 | -2 |
| 4 | 1 |
| 8 | 4 |



$y = \frac{3}{4}x - 2$
y
x
(8, 4)
(4, 1)
(0, -2)

# 3.6 Finding Equations of Lines

① If we know the slope and the y-intercept

$y = mx + b$ slope-intercept form

ex y-int $\overset{x}{(0},\overset{y}{-2)}$ $\overset{x}{(0},\overset{y}{b)}$

slope $= \frac{3}{4}$ $m$

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

ex y-int $(0, 4)$ $(0, b)$

slope $= -\frac{5}{2}$ $m$

$y = mx + b$

$y = -\frac{5}{2}x + 4$

ex $(-1, 5)$, $m = 2$

$(x_1, y_1)$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$(x_2, y_2)$ to be any point $\rightarrow (x, y)$

$$\cancel{(x - x_1)}\,\frac{y - y_1}{\cancel{x - x_1}} = m(x - x_1)$$

$$y - y_1 = m(x - x_1)$$

the point/slope form

$$y - 5 = 2(x - (-1))$$

$$y - 5 = 2(x + 1)$$

$(-1, 5)$
$m = 2$

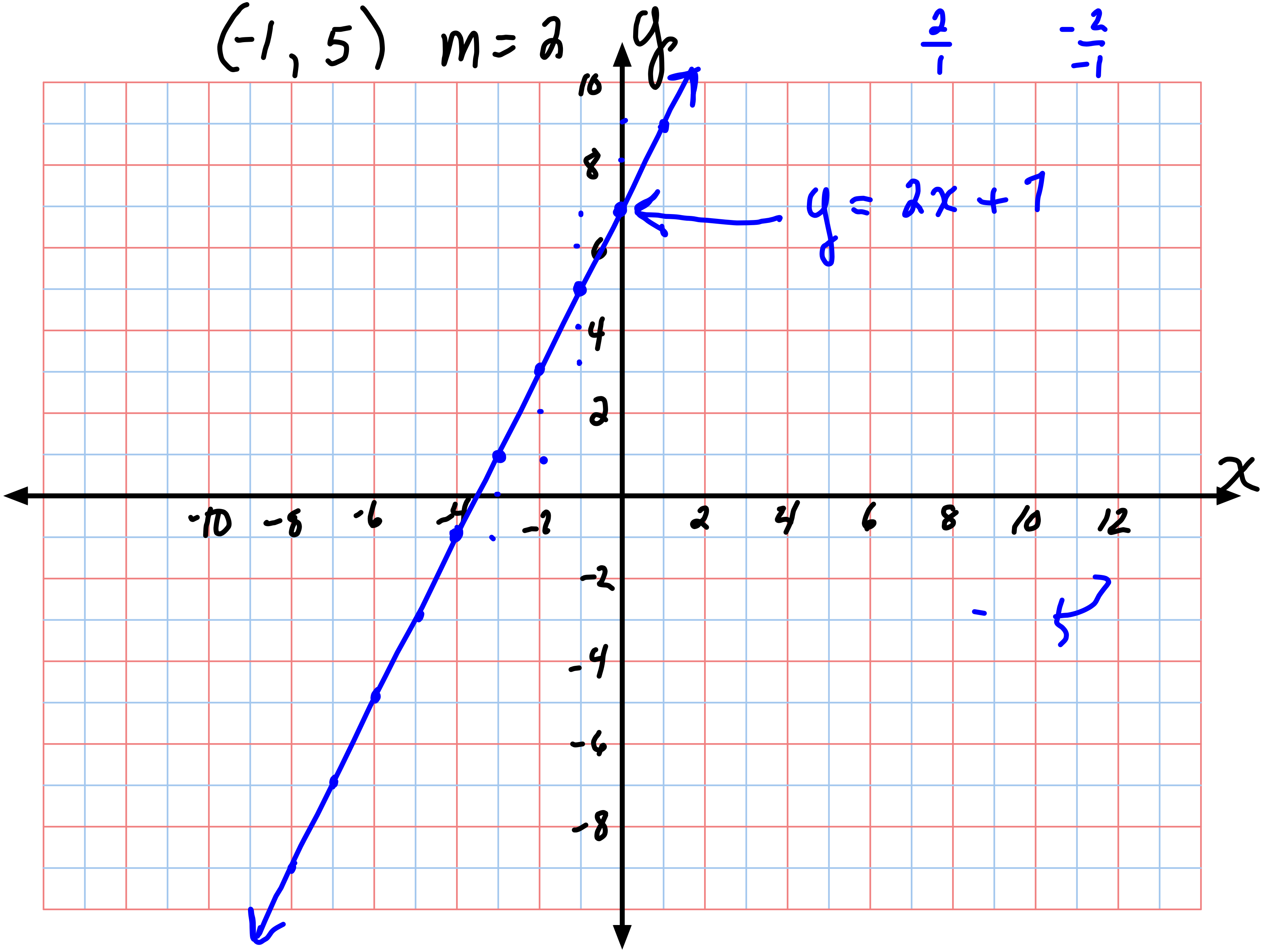
$$\begin{aligned} y - 5 &= 2x + 2 \\ +5 &\quad\;\; +5 \\ \hline y &= 2x + 7 \end{aligned}$$

$m = 2$

y-int $(0, 7)$

$(-1, 5) \quad m = 2$

$\frac{2}{1} \quad \frac{-2}{-1}$



ex Given the point $(3,7)$

$m = \frac{2}{5}$

Point/Slope form

$5(y-7) = \frac{2}{\cancel{5}}(x-3)(\cancel{5})$

$5y - 35 = 2x - 6$

$\quad +35 \qquad\qquad +35$

$\frac{5y}{5} = \frac{2x+29}{5}$

$y = \frac{2}{5}x + \frac{29}{5}$

$y - 3 = 4(x+2)$

point $(-2, 3)$

$m = 4$

③ Two points on the are known

$(2, \overset{b}{-1})$ and $(4, \overset{b}{3})$

$$m = \frac{3+1}{4-2} = \frac{4}{2} = 2$$

$(2,-1)$

$y+1 = 2(x-2)$

$y+1 = 2x-4$

$\underline{\phantom{y}-1} \qquad \underline{-1}$

$y = 2x-5$

$(4,3)$

$y-3 = 2(x-4)$

$y-3 = 2x-8$

$\underline{\phantom{y}+3 \qquad +3}$

$y = 2x-5$

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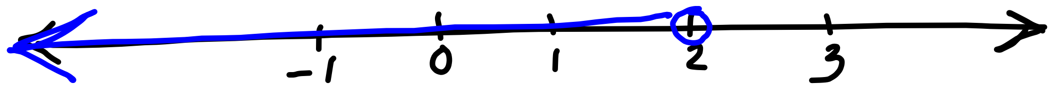
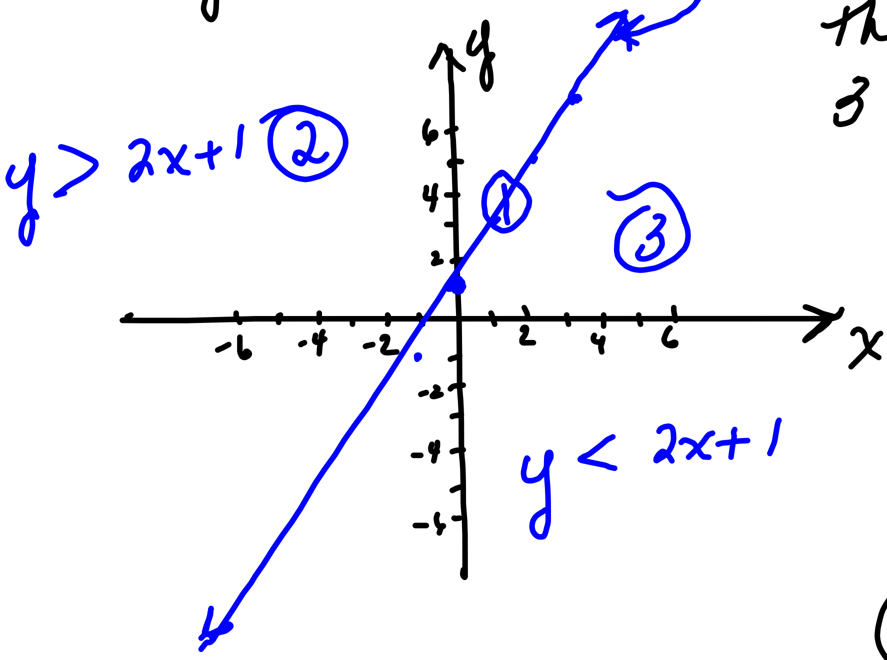
# 3.7 Graphing Linear Inequalities

$x < 2$




ex $y = 2x + 1$




The line divides the plane into 3 parts

1. Points on the line
2. All points above the line
3. all points below the line

$Ax + By > C$

$< C$

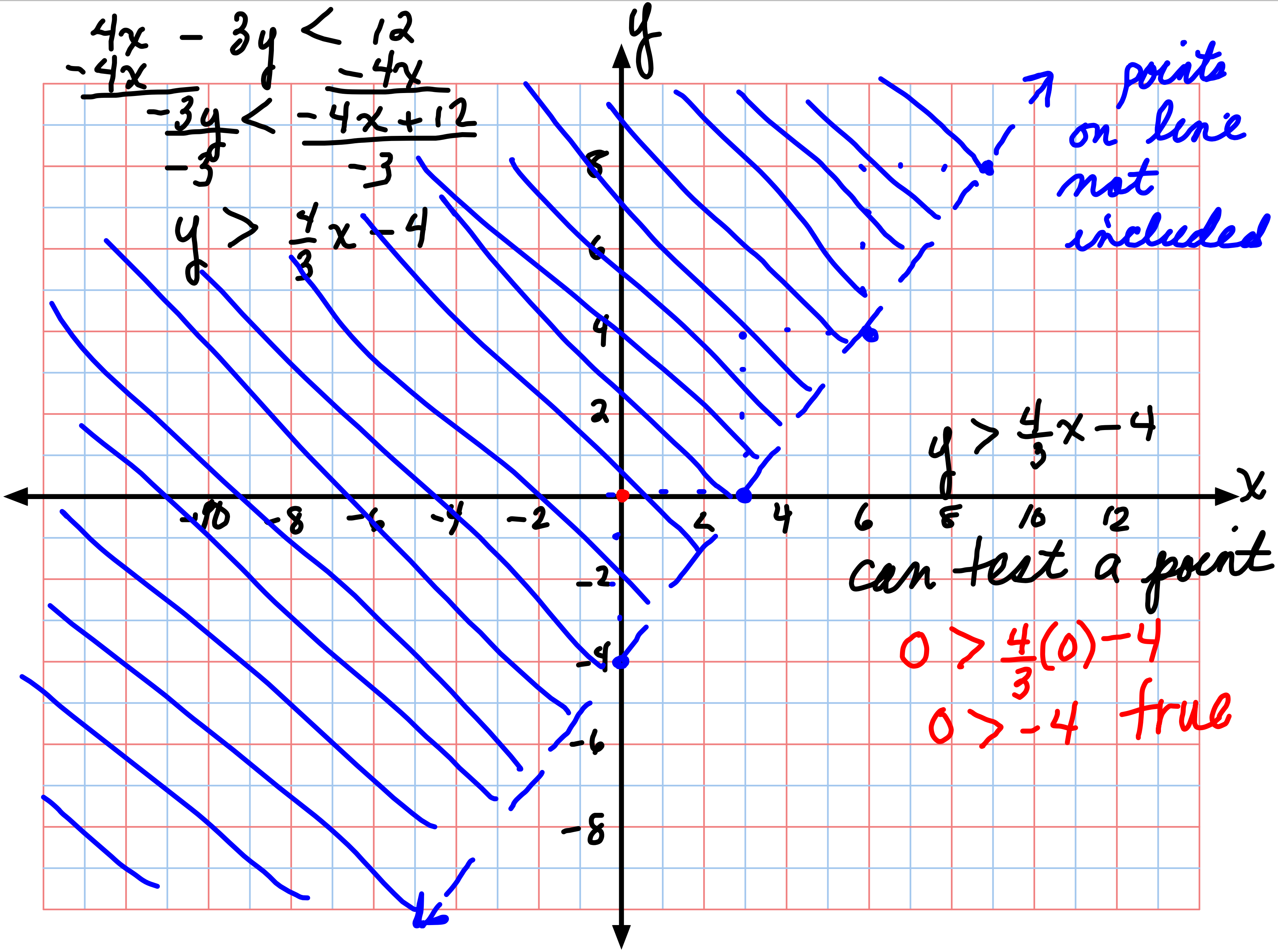
$\geq C$

$\leq C$

Standard Form

Linear Inequality in two variables

$$4x - 3y < 12$$
$$\underline{-4x \qquad\qquad -4x}$$
$$\frac{-3y}{-3} < \frac{-4x + 12}{-3}$$
$$y > \frac{4}{3}x - 4$$




$y > \frac{4}{3}x - 4$

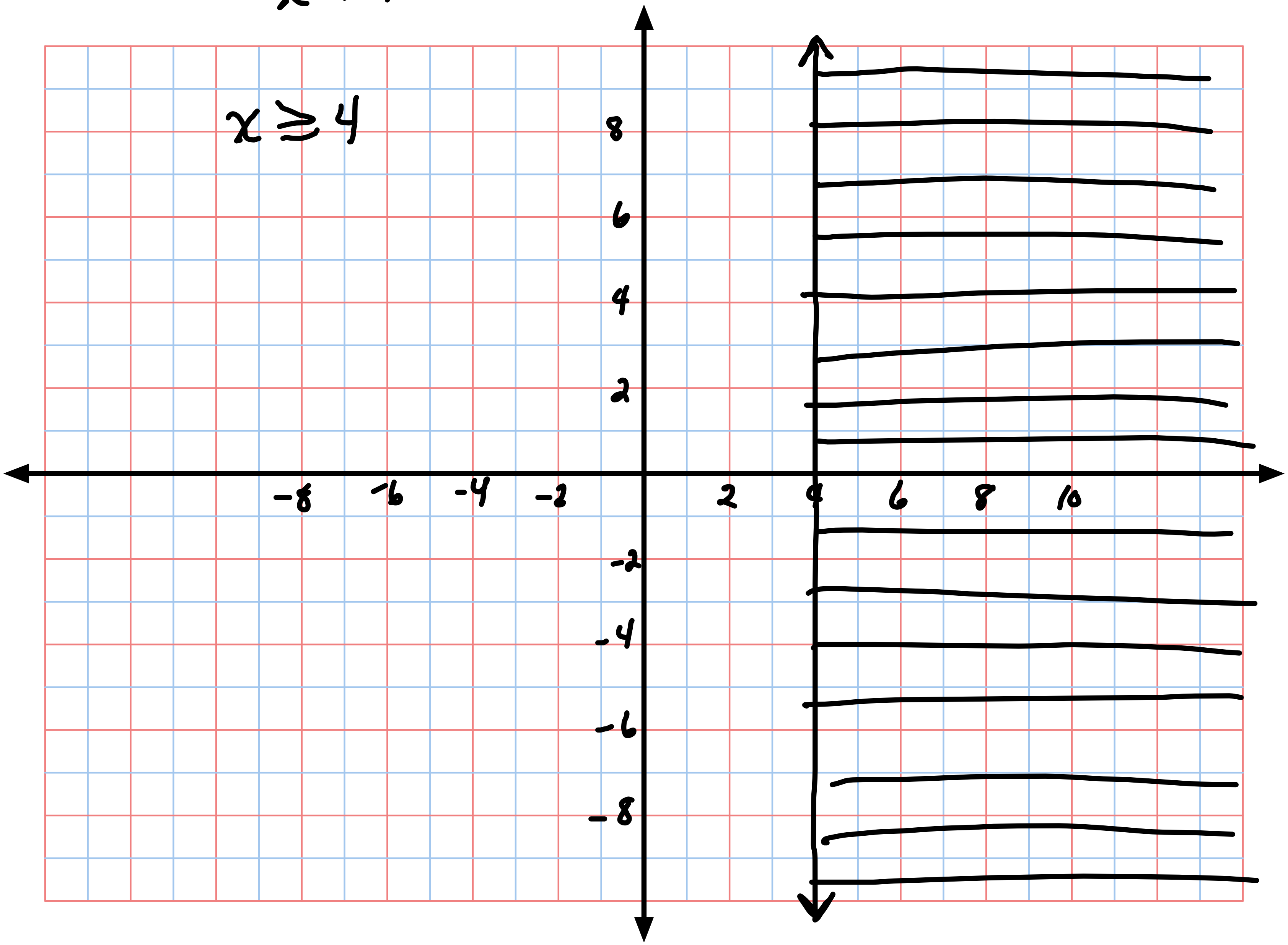
points on line not included

can test a point

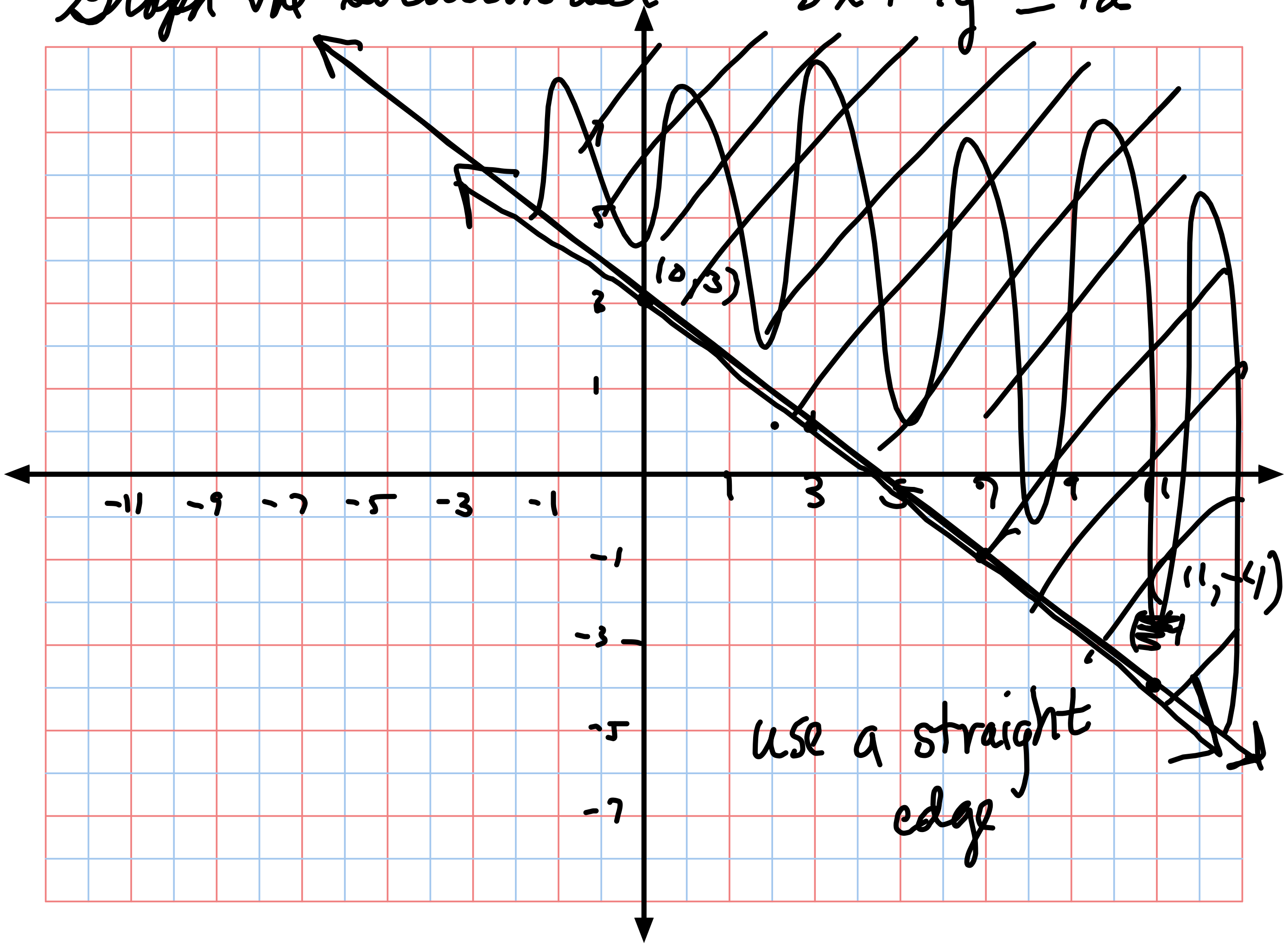
$0 > \frac{4}{3}(0) - 4$

$0 > -4$ true

$x = 4$



Graph the solution set $3x + 4y \geq 12$




use a straight edge