Slope-Point Form of the Equation for a Linear Function (6.5)

Bellwork:

A line has the equation y = mx + 6. Find the value of m in regards to the line if the line passes through the point G(-3,5).

$y = mx + 6$

$G(-3, 5)$

$y = \frac{1}{3}x + 6$

$\frac{6-5}{0+(-3)} = \frac{1}{3}$

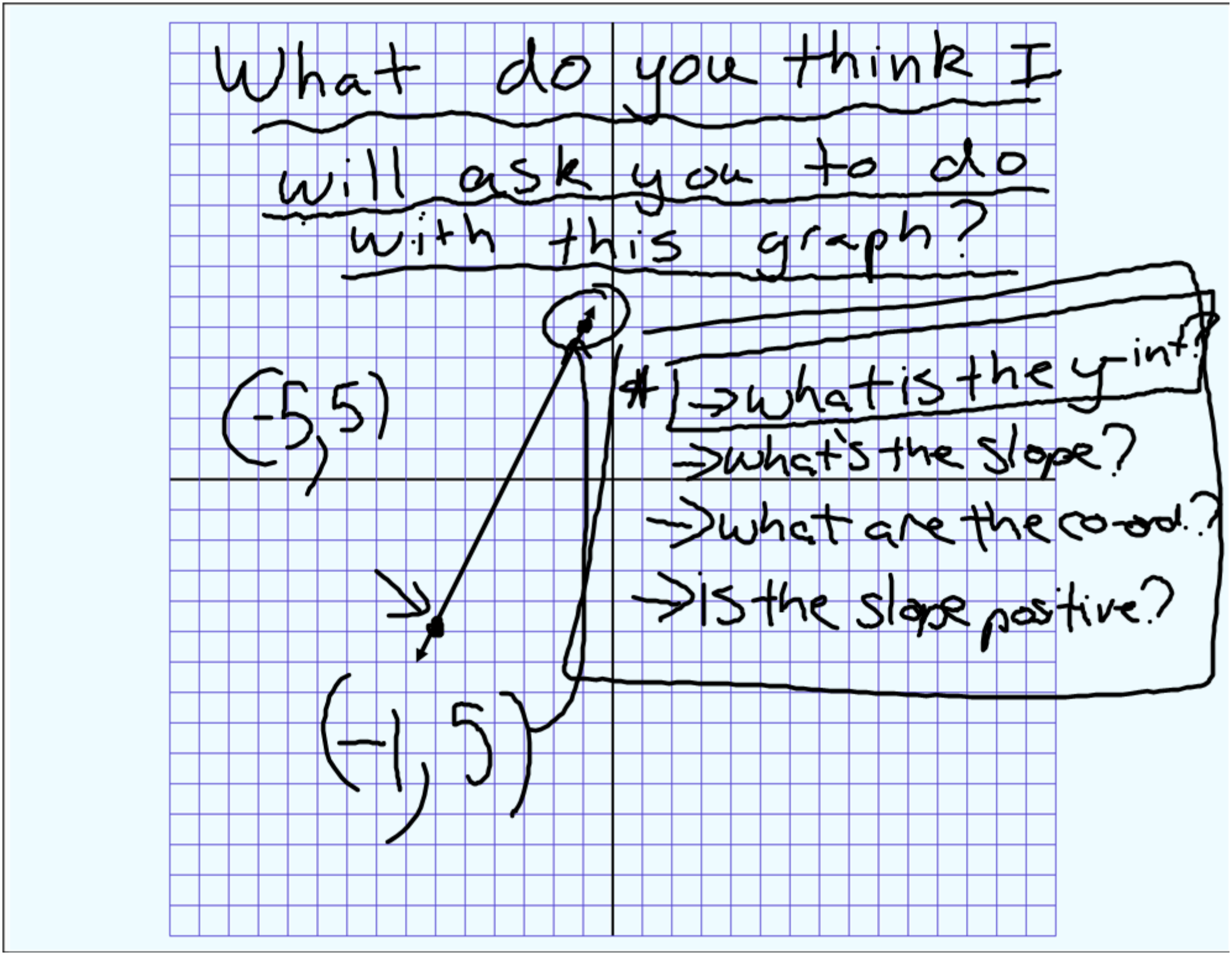
(,)

$5 = m(-3) + 6$

$-6 \quad -6$

$\frac{-1}{3} = \frac{m(-3)}{-3}$

$\frac{1}{3} = m$


What do you think I will ask you to do with this graph?
(-5, 5)
(-1, 5)
* → what is the y-int?
→ what's the slope?
→ what are the co-ord.?
→ is the slope positive?

What information do you need to solve this question?

→ numbers
→ two points (co-ordinates)
→ slope
→ the y-intercept.

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

- A new formula

$(-1, 5)$ $(-5, -5)$

(x_1, y_1) (x_2, y_2)

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

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

$y - 5 = \frac{5}{2}(x + 1)$

$\frac{-5-5}{-5+1}$

$= \frac{-10}{-4} = \frac{5}{2}$

Example #1:

a) Describe the graph of the linear function with this equation:

$y - 2 = \frac{1}{3}(x + 4)$

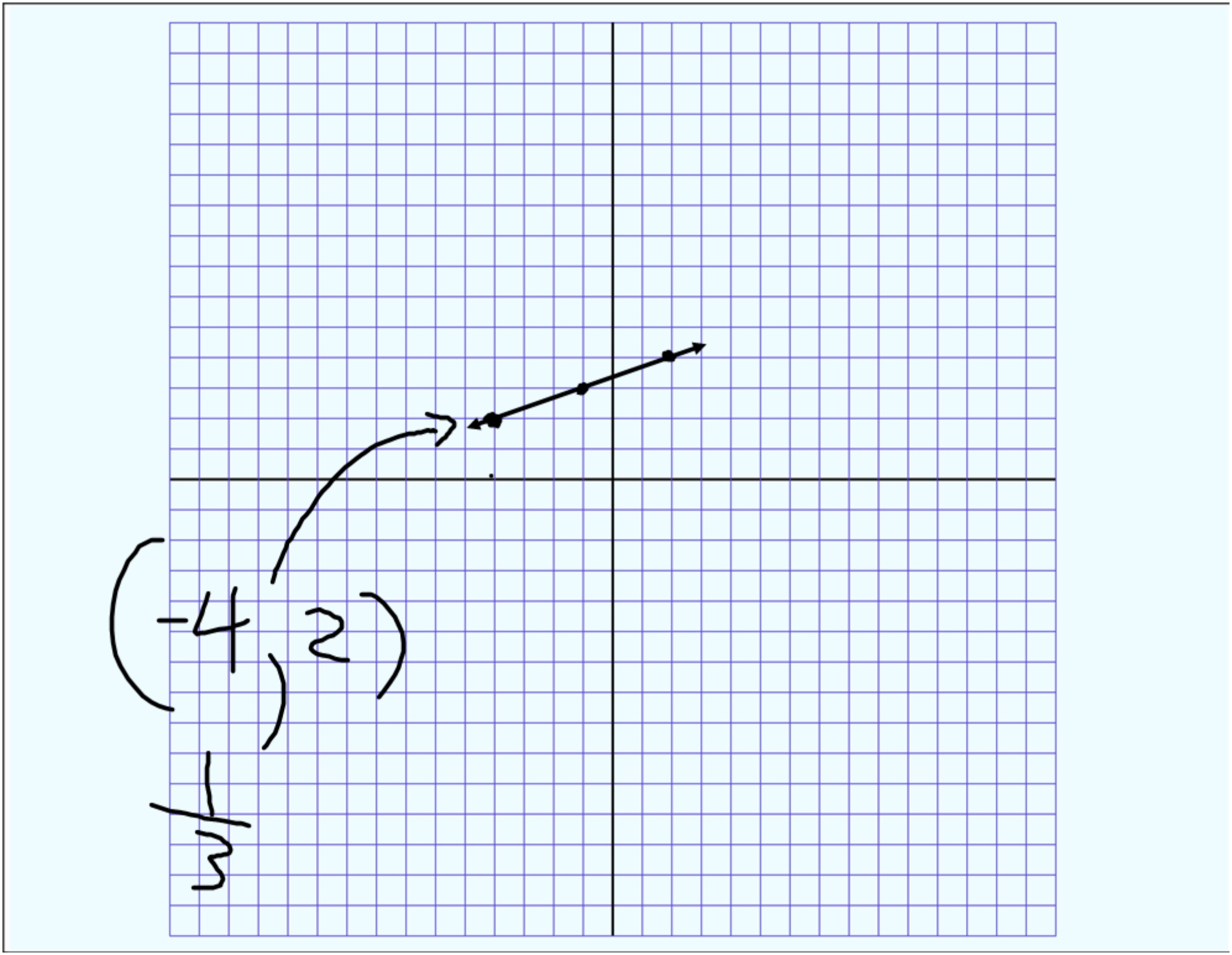
$y - y_1 = m(x - x_1)$

b) Graph the equation.

a) Slope $(m) = \frac{1}{3}$

Point $= (-4, 2)$

x_1 y_1


(-4, 2)

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

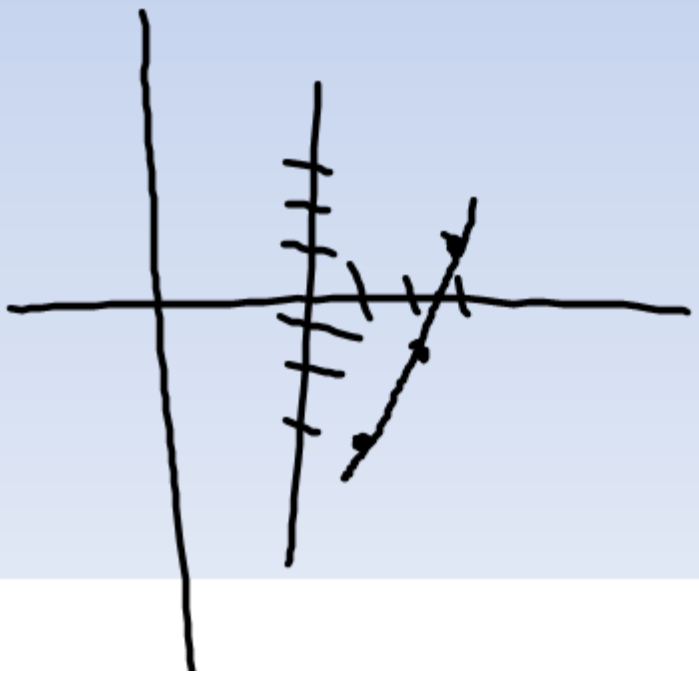
when finding x_1 or y_1, use the opposite sign

ex) $-3 \Rightarrow +3$

$(1, -3)$

point/coordinate

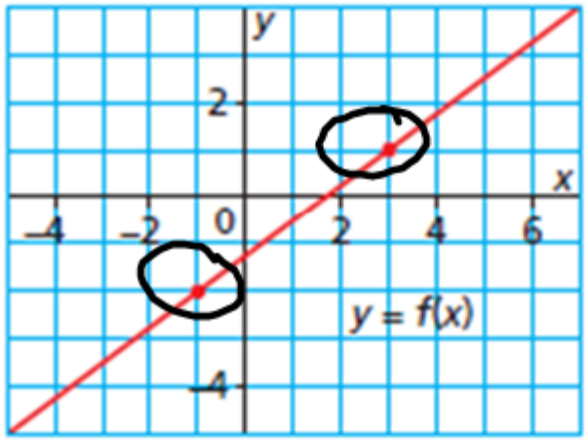
$$\text{slope} = \frac{2}{1}$$



Example #2:

a) Write an equation in slope-point form for this line.

b) Write the equation in part a in slope-intercept form. What is the y-intercept of this line?



$(3, 1)$ (x_1, y_1)

$y - 1 = m(x - 3)$

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

$(-1, -2)$ (x_2, y_2)

$\frac{-2-1}{-1-3}$

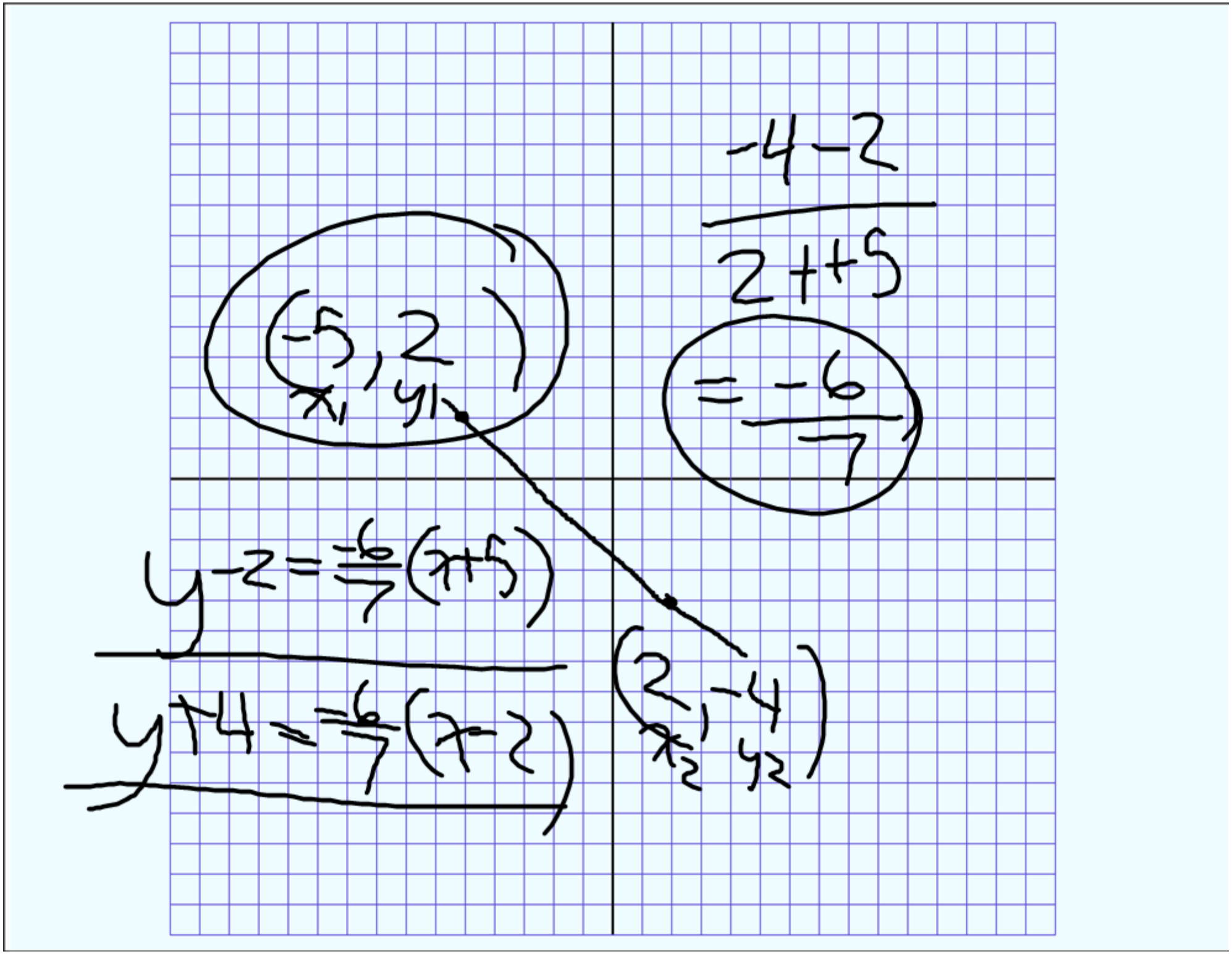
$y + 2 = \frac{3}{4}(x + 1)$

Example #3:

The sum of the angles, s degrees, in a polygon is a linear function of the number of sides, n, of the polygon. The sum of the angles in a triangle is 180°. The sum of the angles in a quadrilateral is 360°.

a) Write a linear equation to represent this function.

b) Use the equation to determine the sum of the angles in a dodecagon.


$\frac{-4-2}{2+5}$
$= \frac{-6}{7}$
$(-5, 2)$
$x_1 \; y_1$
$(2, -4)$
$x_2 \; y_2$
$y-2=\frac{-6}{7}(x+5)$
$y+4=\frac{-6}{7}(x-2)$

Example #4:

Write an equation for the line that passes through R(1, −1) and is:

a) parallel to the line $y = \frac{2}{3}x - 5$

b) perpendicular to the line $y = \frac{2}{3}x - 5$

x_1 y_1

A) $m = \frac{2}{3}$

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

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

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

$$y = \frac{2}{3}x + 5$$

$$y = \frac{2}{3}x + 5$$