

Problem 3 (15 points). Use what you know about linear functions to answer the following questions.

(5 points) a) Give the equation for a line through  $(-4, 8)$ ,  $(2, -1)$

$$m = \frac{8 - (-1)}{-4 - 2} = \frac{9}{-6} = -\frac{3}{2}$$

Can check answer by plugging both points

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

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

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

$$\hookrightarrow -1 = -3 + b \Rightarrow b = +2$$

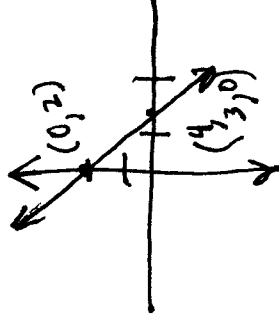
(5 points) b) Graph the line from part a) and label the x and y intercepts.

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

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

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

$$x = \frac{4}{3}$$



(5 points) c) Find the intersection of the line from part a) with the line  $y = 2x + \frac{1}{2}$ .

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

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

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

$$-\frac{7}{2} = \frac{7}{2}x$$

$$-1 = x$$

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

$(-1, \frac{3}{2})$  is point of intersection

Can check by plugging  $(-1, \frac{3}{2})$  into both equations.