10-13-13

Sec 3.5

3.5 lines, slopes, rates

problems

EX

1 → 11, 13, (19, 25)

2 → 39, 41

3, 4 → 55, 57

5 → 63, 65

3.6

EX equations of lines

problems

1 → 7, 9, 11

2 → 19, 27, 31

3 → 35, 37

4 → 43

5 → 47, 55, 59

6 → (63), 65

3.5

(11.) $(X_1, Y_1) = (10, 600)$

$(X_2, Y_2) = (25, 1500)$

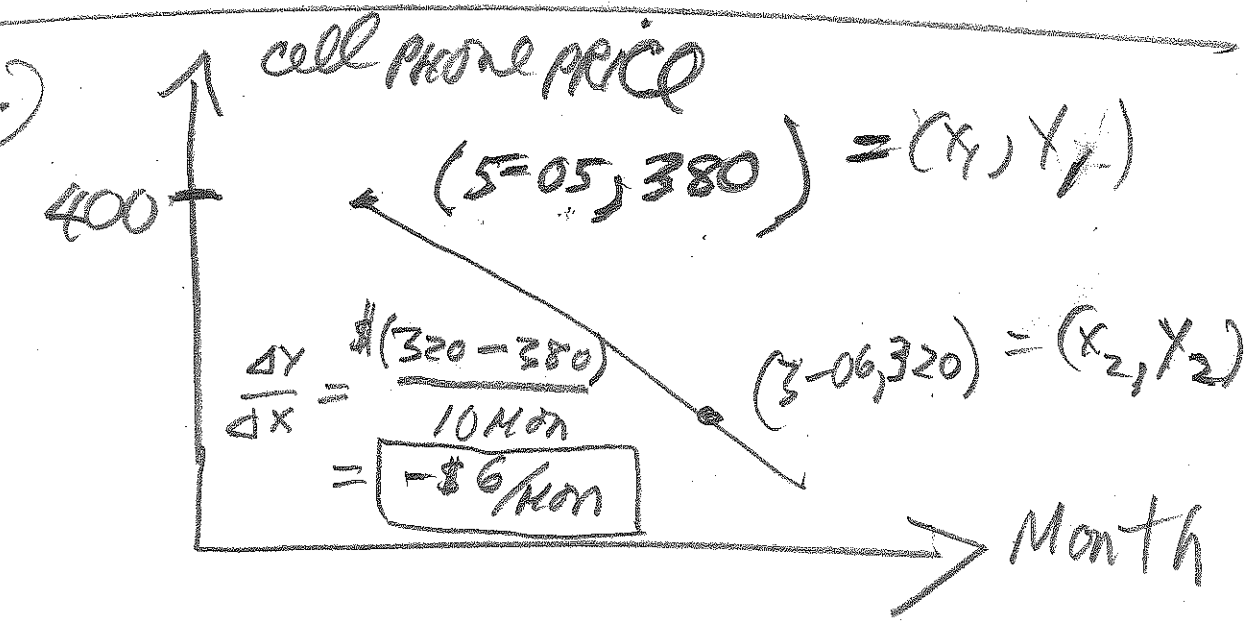
$$\frac{Y_2 - Y_1}{X_2 - X_1} = \frac{\Delta Y}{\Delta X} = \frac{1500 - 600}{25 - 10} = \frac{900}{15}$$

$$= 60 \frac{\$}{\text{BLOG}}$$

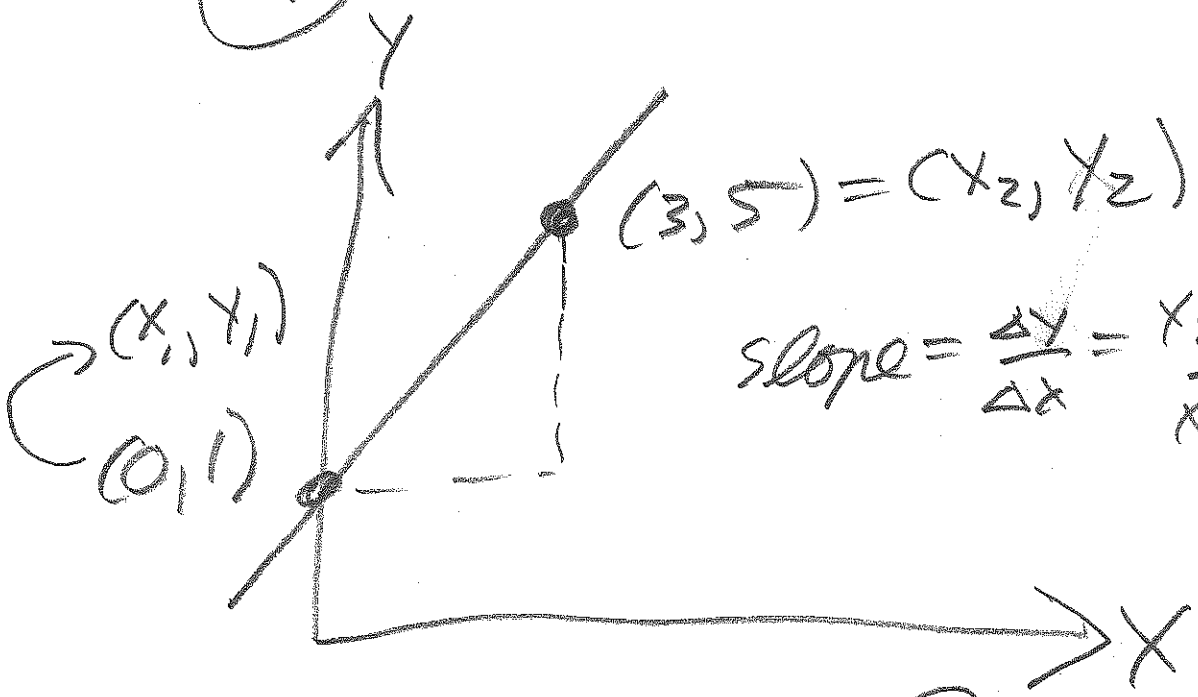
$$15\overline{)900} \quad 60$$

$$= \frac{\$60}{\text{BLOG}}$$

(13.)



(19)



$$\text{slope} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\text{slope} = \frac{5-1}{3-0} = \frac{4}{3}$$

SHORT cut

$$(3,5) = (x_2, y_2)$$

$$(0,1) = (x_1, y_1)$$

$$3 \,|\, 4 \Rightarrow \frac{4}{3}$$

Comment: counting is OK
BUT could slow you
down

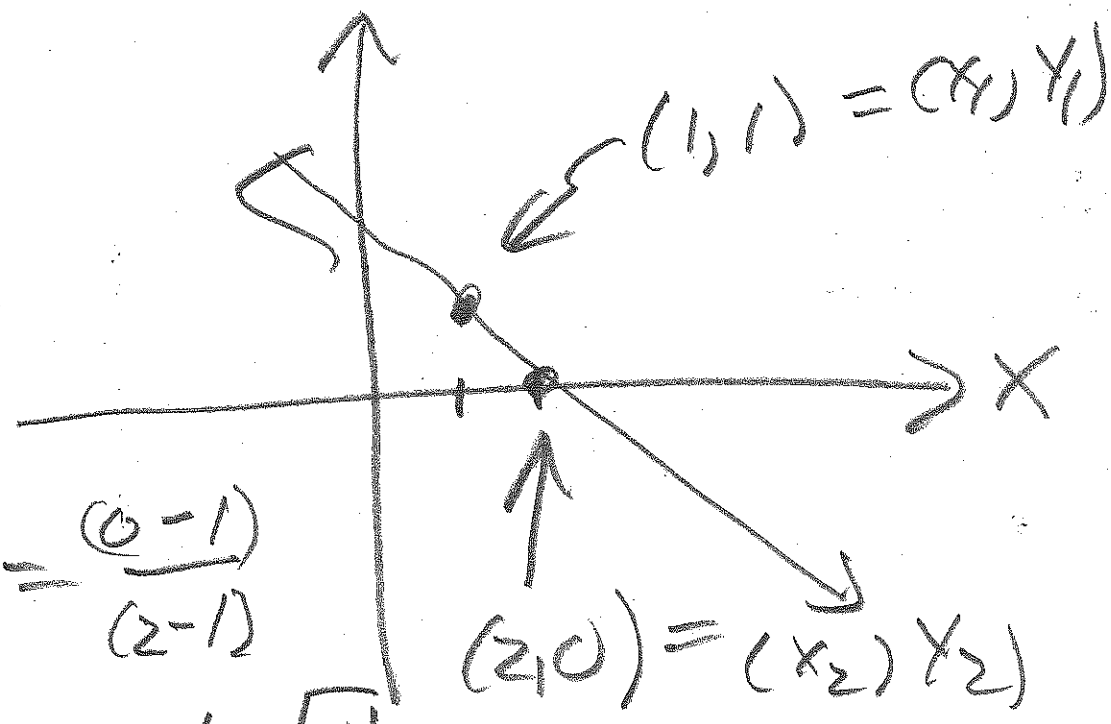
ORDER DOES NOT MATTER (4

(19.)

$$(0,1)$$

$$\frac{-(3,5)}{-3,-4} \Rightarrow \frac{-4}{-3} = \frac{4}{3}$$

(25.)



$$\frac{\Delta y}{\Delta x} = \frac{(0-1)}{(2-1)}$$

$$= \frac{-1}{1} = \boxed{-1}$$

shortcut

$$\begin{matrix} 1-2=-1 \\ 1-0=1 \end{matrix} \left\{ \frac{-(2,0)}{(1,1)} \right.$$

$$-1,1 \Rightarrow \frac{1}{-1}$$

OR

$$\frac{(2,0)}{-(1,1)}$$

$$1,-1 \Rightarrow \frac{1}{-1}$$

(39.)

(1, 3) and (5, 8)

(x_1, y_1) (x_2, y_2)

$$\frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{8-3}{5-1} = \frac{5}{4}$$

Steeper cut:

(5, 8)

$-(1, 3)$

$4, 5 \Rightarrow \frac{5}{4}$

(1, 3)

$-(5, 8)$

$-4, -5$

$\Rightarrow \frac{-5}{-4} = \frac{5}{4}$

4(a) (x_1, y_2) $\qquad$ (x_2, y_2)

$(-2, 4)$ and $(3, 0)$

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{0-4}{3-(-2)} = \frac{-4}{5} = -\frac{4}{5}$$

Shortcuts

$(-2, 4)$ $\qquad$ $(3, 0)$

$-(3, 0)$ $\qquad$ or $\qquad$ $-(-2, 4)$

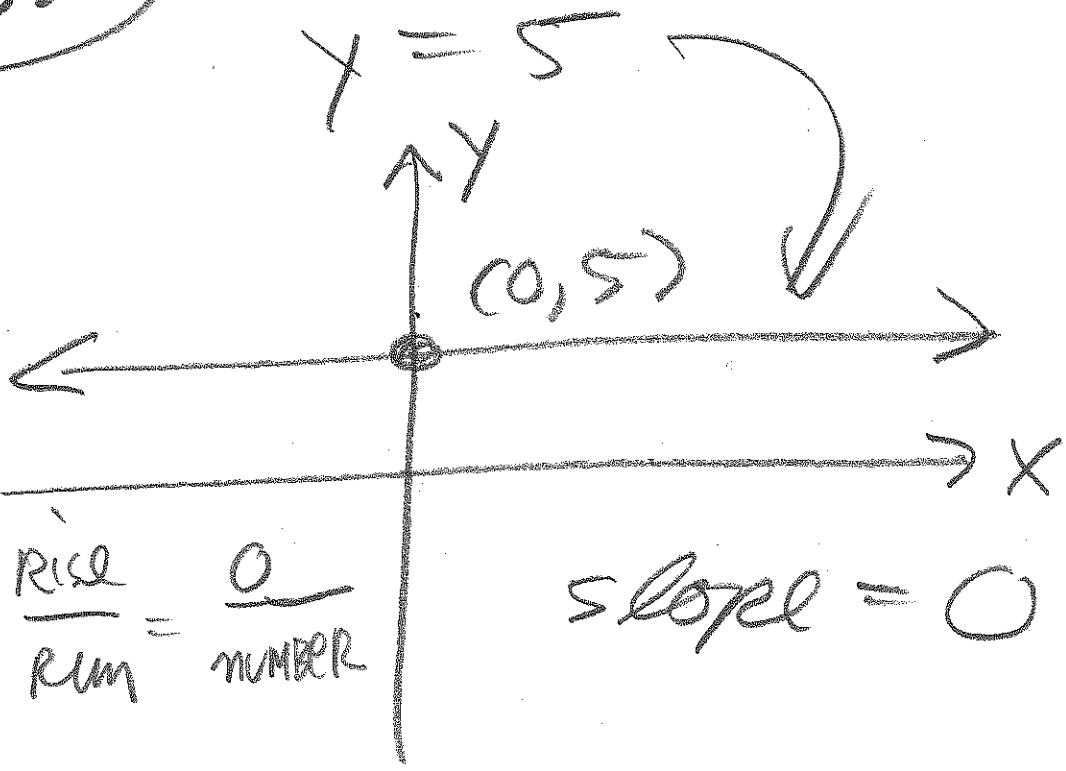
$-5, 4$ $\qquad$ $5, -4$

$-2 - 3 = -5$ $\qquad$ $3 - (-2) = 3 + 2 = 5$

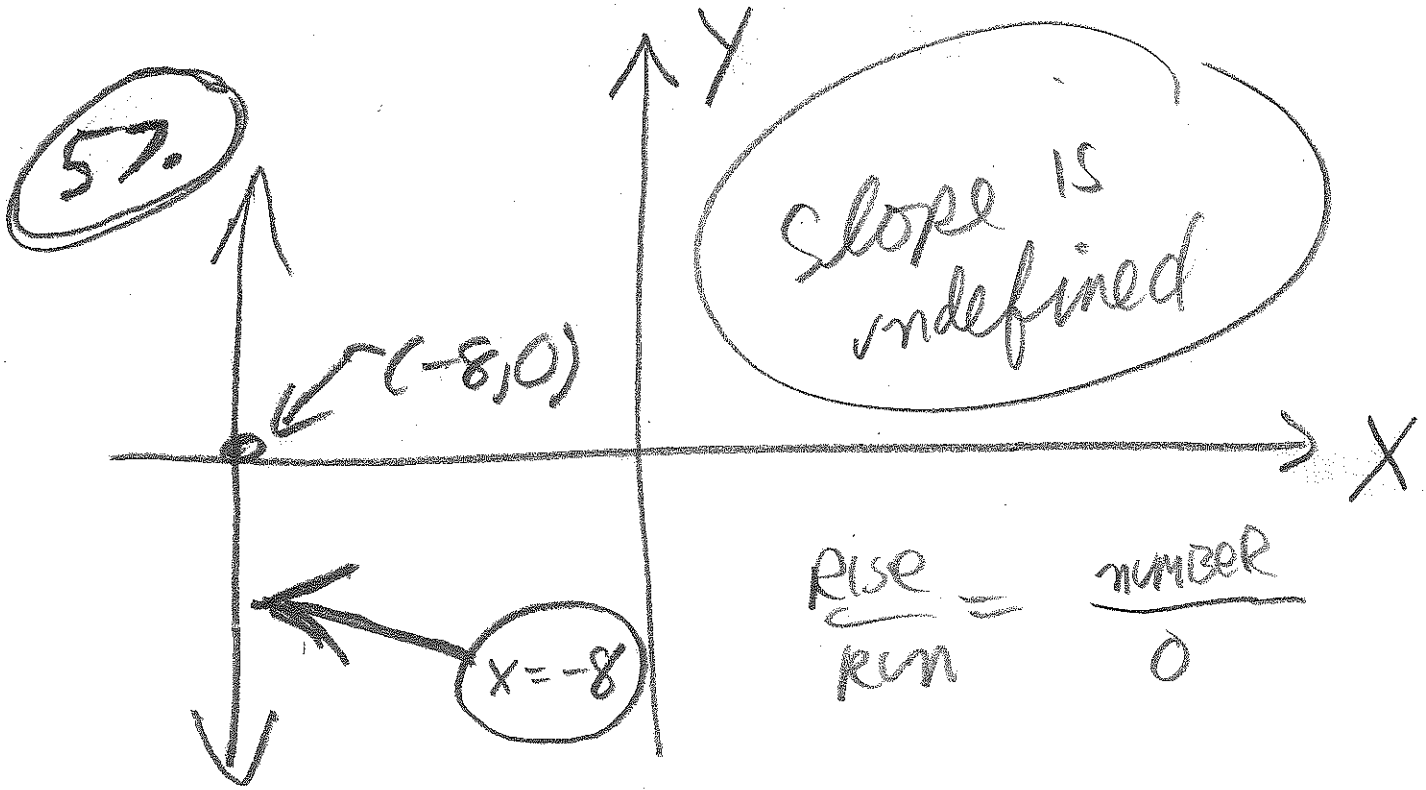
$4 - 0 = 4$ $\qquad$ $0 - 4 = -4$

$\frac{4}{-5} = -\frac{4}{5}$ $\qquad$ $\frac{-4}{5} = -\frac{4}{5}$

55.


y = 5
y
(0, 5)
x
Rise / Run = 0 / number
slope = 0

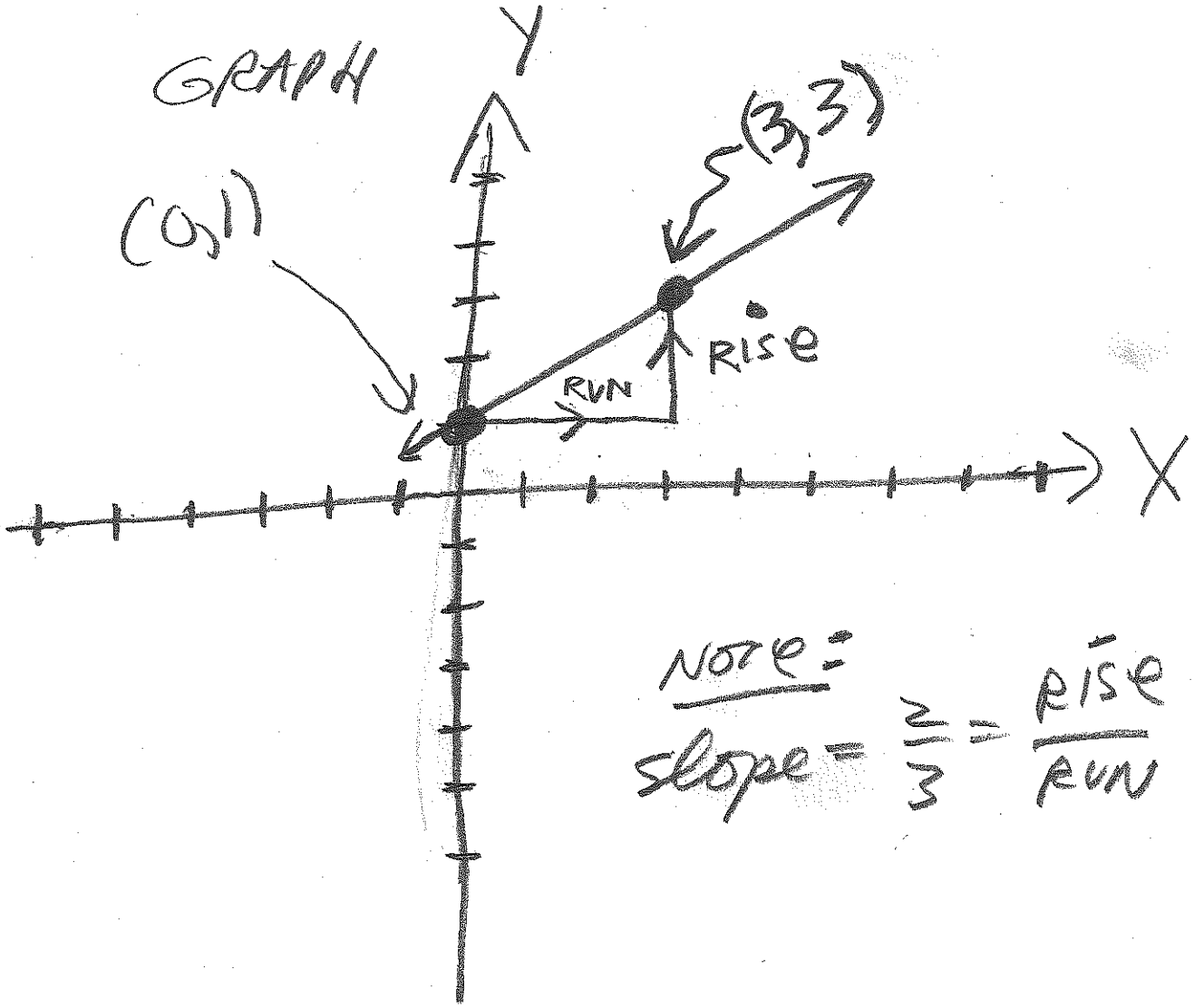
57.


y
slope is undefined
(-8, 0)
x
x = -8
Rise / Run = number / 0

Sec 3.6

(7.) slope $= \frac{2}{3}$; y-intercept $= (0,1)$

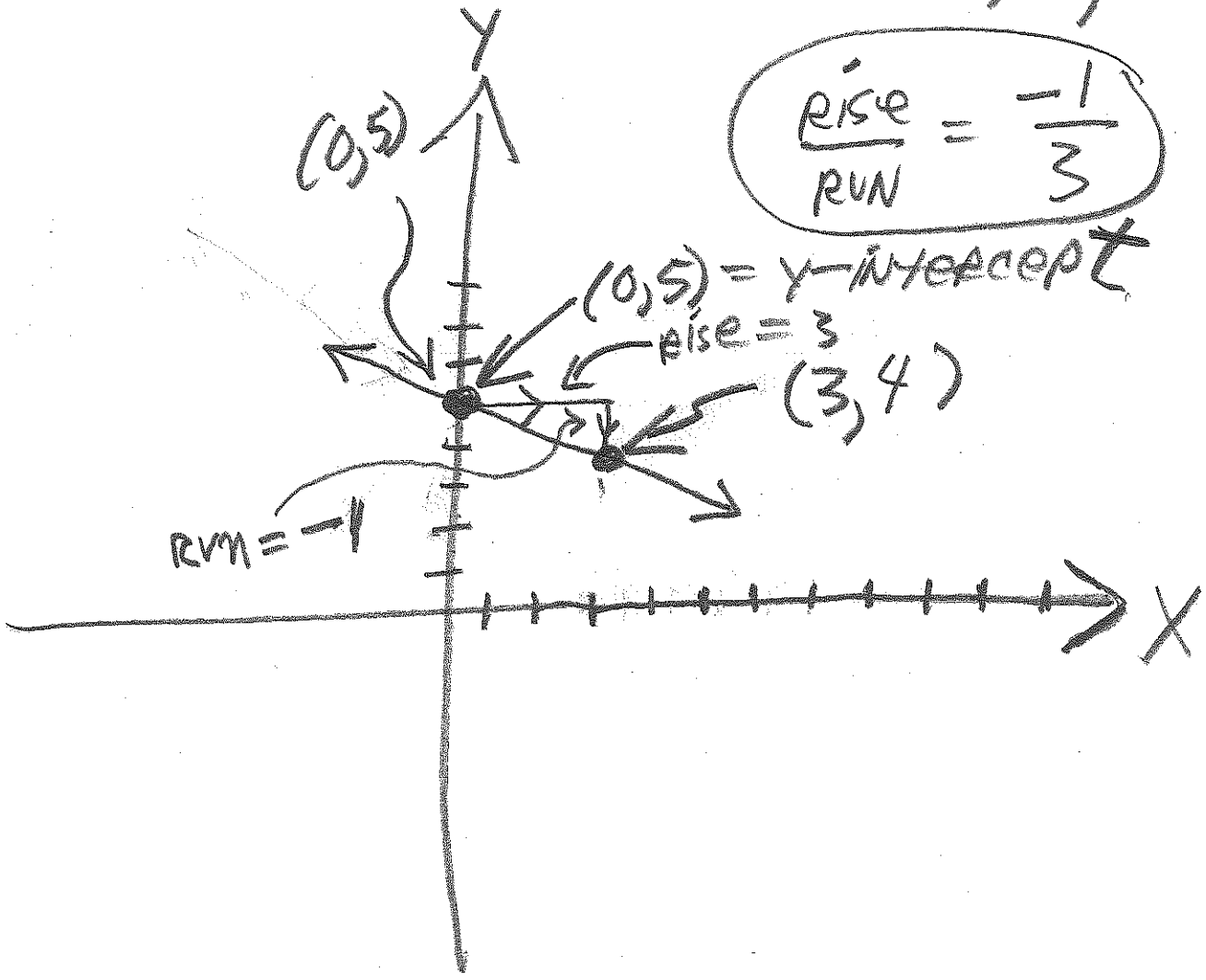
GRAPH



Note: slope $= \frac{2}{3} = \frac{\text{RISE}}{\text{RUN}}$

ADD

(11.) slope $= -\frac{1}{3}$; y-intercept $= (0, 5)$



$\frac{\text{rise}}{\text{run}} = \frac{-1}{3}$

(19.) $y = -\frac{2}{7}x + 5$

$y = mx + b$

$m = \text{slope} = \frac{\text{RISE}}{\text{RUN}} = -\frac{2}{7}$

(10)

(19) $(0,b) = (0,5)$ = y-intercept

$\boxed{b = 5}$

need $y = mx + b$

(31.) $2x - 5y = -8$ solve for y

$-2x \qquad -2x$

$-5y = -2x - 8$

$\frac{-5y}{-5} = \frac{-2x - 8}{-5}$

$y = \frac{-2x}{-5} + \frac{8}{5}$ *

$\frac{-2x + (-8)}{-5}$

$= \frac{-2x}{-5} + \frac{(-8)}{-5}$

$= \frac{2x}{5} + \frac{8}{5}$

$y = \frac{2}{5}x + \frac{8}{5}$

$y = mx + b$

$m = \frac{2}{5}, \; b = \frac{8}{5}$

$(0,b) = (0, \frac{8}{5})$

(21.) $4x + 2y = 8$

$-4x \qquad -4x$

$2y = -4x + 8$

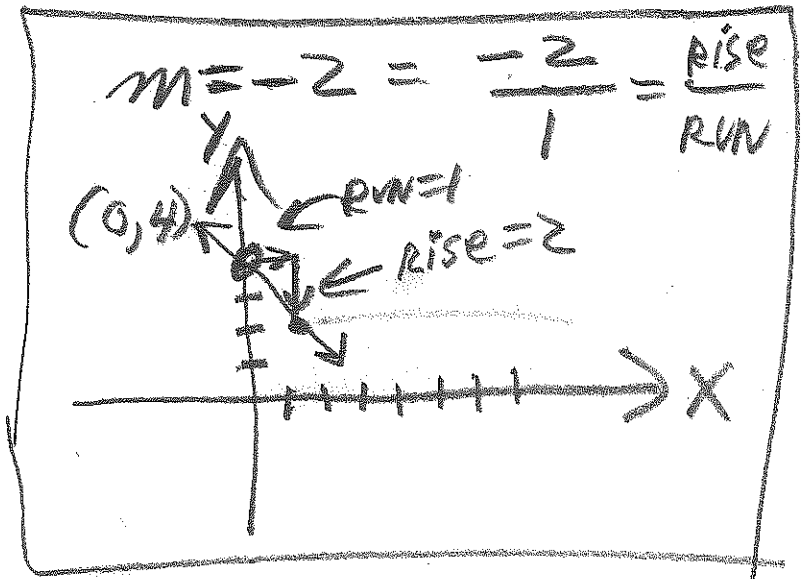
$\frac{2y}{2} = \frac{-4x+8}{2}$

$y = -2x + 4$

$m = -2, (0,b)$

$= (0,4)$

$b = 4$



35.

$\text{slope} = m = 5 = \frac{5}{1}$

$(0, 7) = (0, b)$

$\Rightarrow b = 7$

$y = mx + b$

$\boxed{y = 5x + 7}$

37. $m = \frac{7}{8}$; $y\text{-int} = (0, b)$

$= (0, -1)$

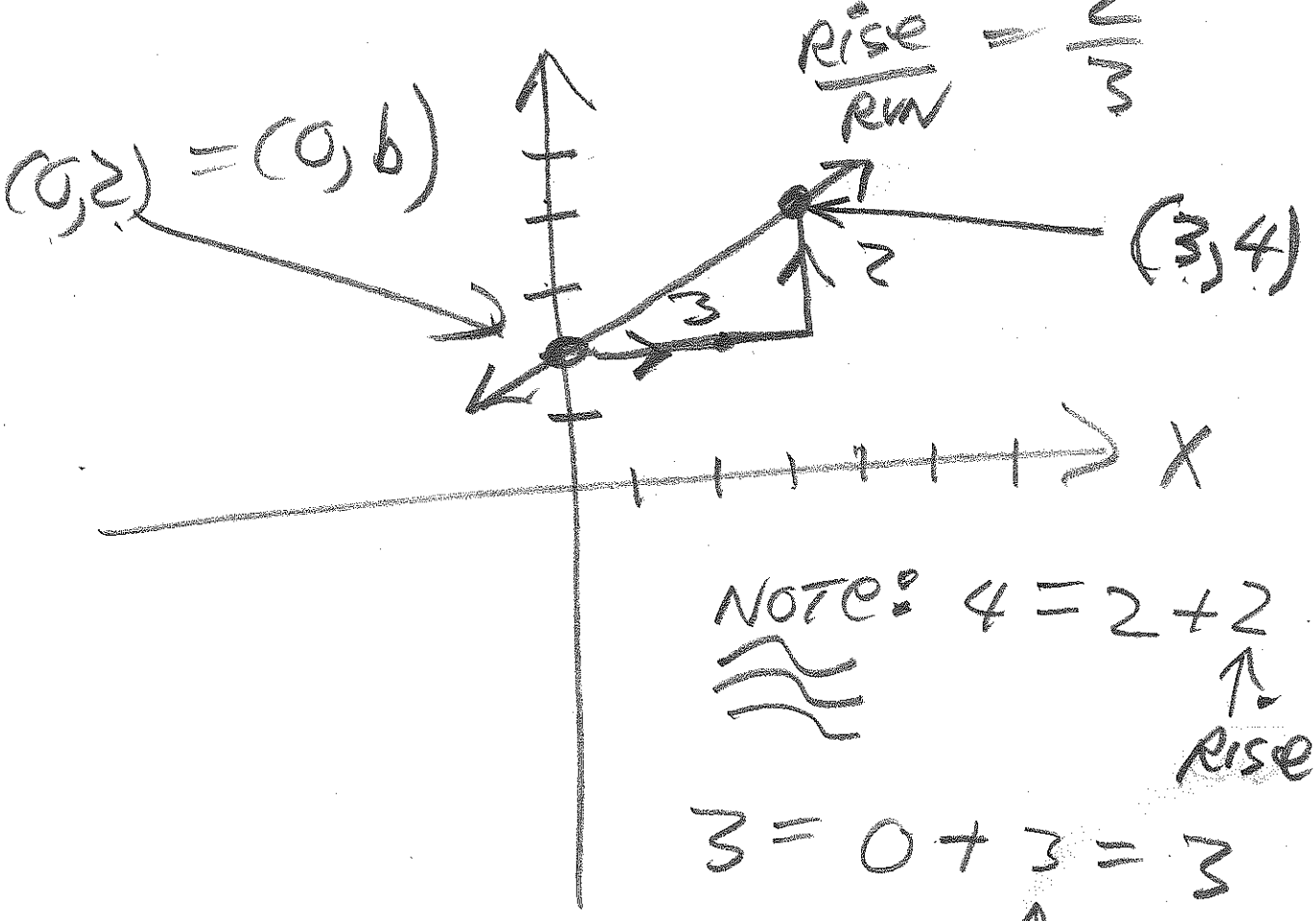
$y = mx + b$

$y = \frac{7}{8}x + (-1)$

$\boxed{y = \frac{7}{8}x - 1}$

(43.) later

(47.) GRAPH $y = \frac{2}{3}x + 2$



NOTE: $4 = 2 + 2$

↑ Rise

$3 = 0 + 3 = 3$

↑ Run

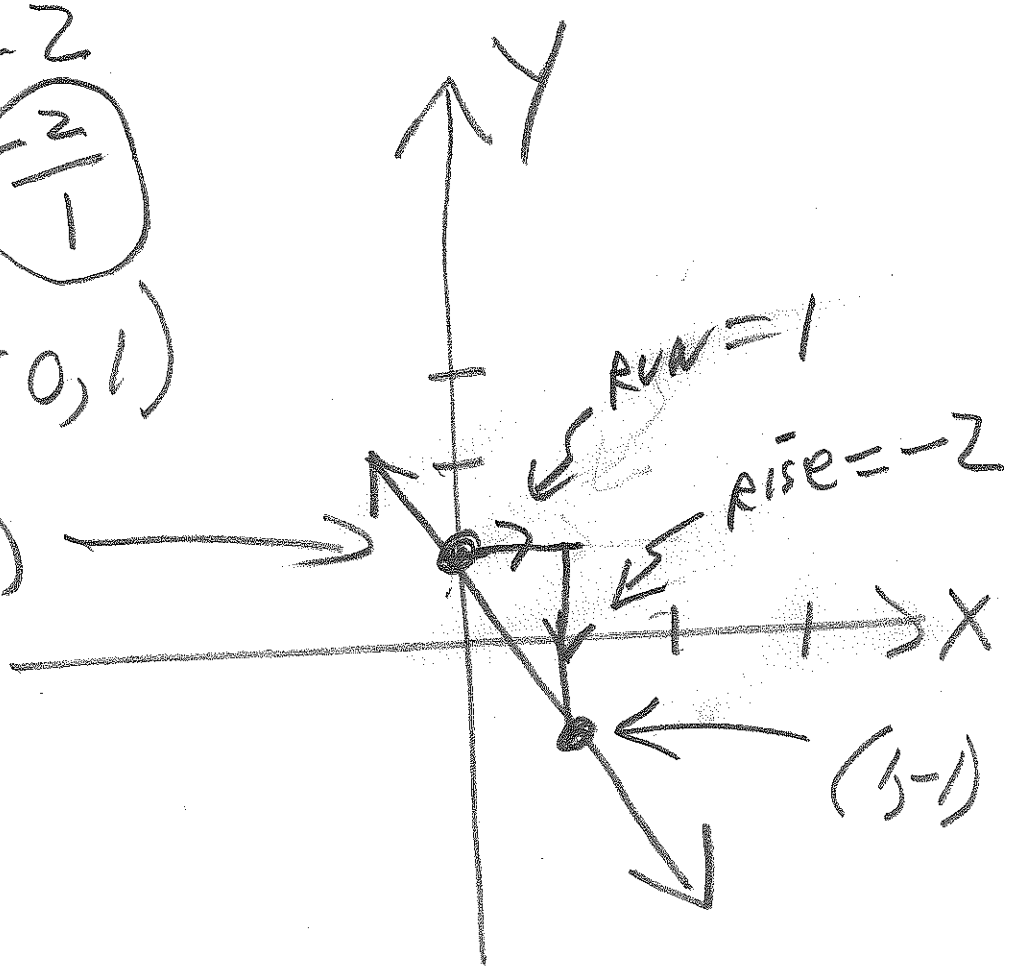
(55.) $2x + y = 1$

$-2x \qquad -2x$

$y = -2x + 1$

$\frac{\text{Rise}}{\text{Run}} = m = -2 = \frac{-2}{1}$

$(0, b) = (0, 1)$



(5.) NO. NOT parallel: PROOF FOLLOWS

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

$4x + 2y = 9$ (2.)

are these lines parallel?

check if same m.

$y = mx + b$ line (1.)

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

$4x + 2y = 9$ line (2.)

$-4x \qquad -4x$

$2y = -4x + 9$

$\frac{2y}{2} = \frac{-4}{2}x + \frac{9}{2} \Rightarrow y = -2x + \frac{9}{2}$

$(m = -2)$

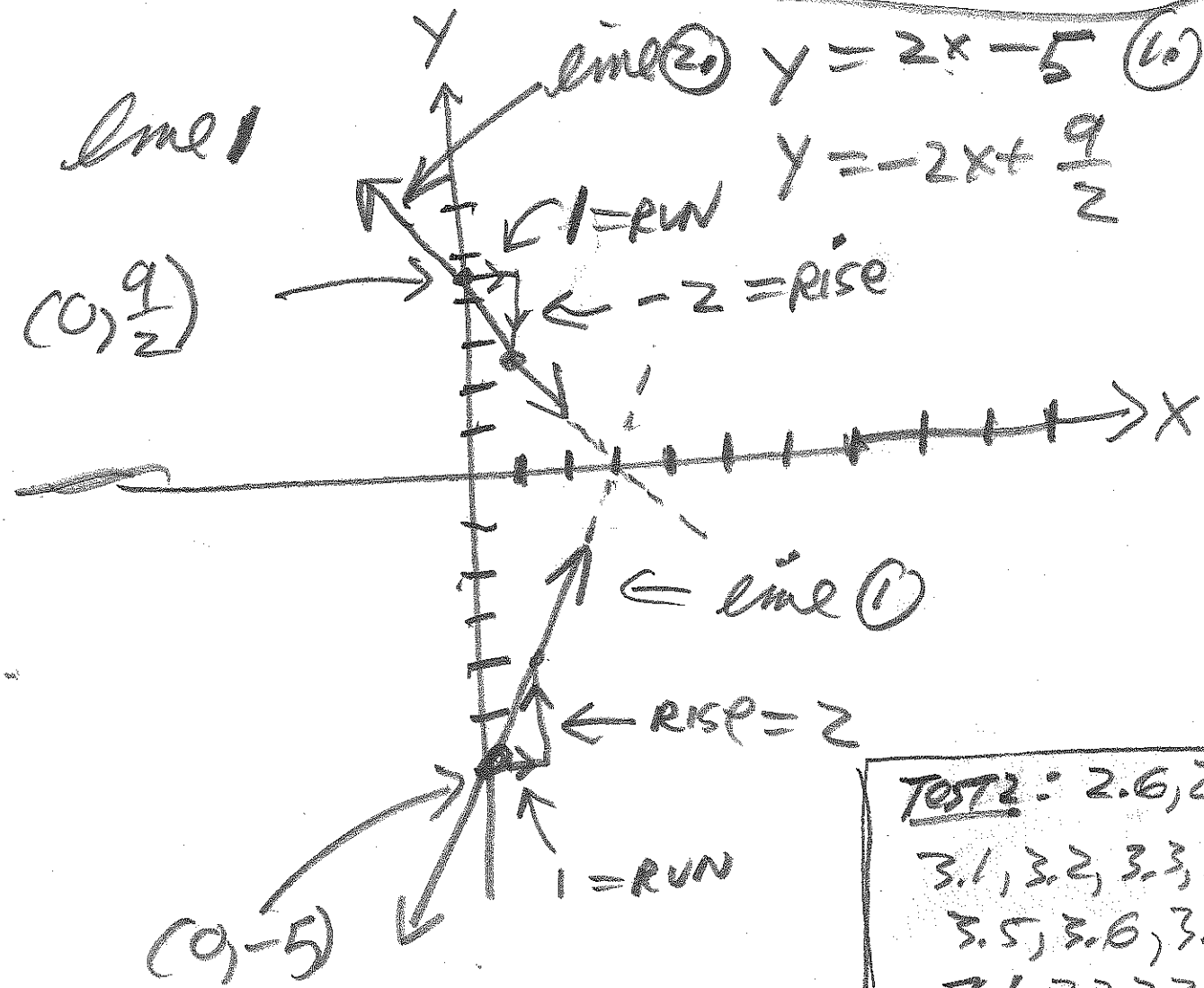
(6.5c)

line 1: slope = 2

line 2: slope = −2

NOT parallel

Lines will cross AKA intersect



TEST: 2.6, 2.7
3.1, 3.2, 3.3, 3.4,
3.5, 3.6, 3.7
7.1, 7.2, 7.3, 7.4