Sections 2.4 & 2.5 - Equations of Lines

In class work: Solve each problem.

Exercise #1 Complete the following ordered pairs to make solutions to the equation $x+2y=8$: $(0,?),(?,0),\left(-\frac{4}{3},?\right)$

Exercise #2 Complete the table for the equation $y=\frac{2}{3}x$:

x	y
0	
	2
-1	
	3/2

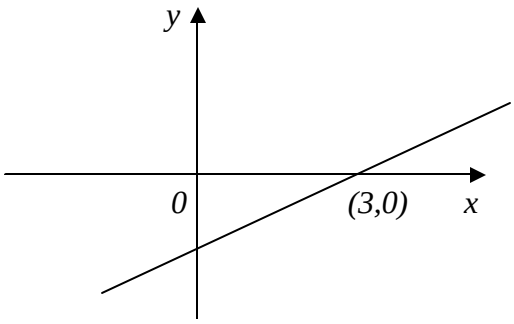
Exercise #3 The graph of $2x-3y=6$ is given .

a) Is $(0,0)$ a solution?

b) Is $(3,0)$ a solution?

c) Is *(-2,1)* a solution?

Prove algebraically and graphically.



Exercise #4 An equation for the concentration of toxic chemicals is $C=285-15t$, where C is the concentration in part per milliliter (ppm), and t is the number of years from now.

a) Find the intercepts of the graph and graph the equation using the intercepts.
b) What is the significance of the intercepts ?

Exercise #5 A computer store budgets $12,000 to buy computers and laser printers. Each computer costs $650 and each printer costs $200.

a) Write an equation that models the given situation.
b) Sketch the graph. Be sure to label the axes clearly.
c) What is the significance of the intercepts?
d) If the store buys 4 computers, how many printers can they buy?

Exercise #6 What is the equation of the

a) horizontal line that passes through (2,3) ?
b) vertical line that passes through (4,-3) ?
c) x-axis?
d) y-axis?

Exercise #7 The weight (in kilograms) of a pumpkin is measured as it grows over a particular month. After 2 days, the pumpkin weighed 3 kilograms while at 31 days, the pumpkin's weight was 9 kilograms.

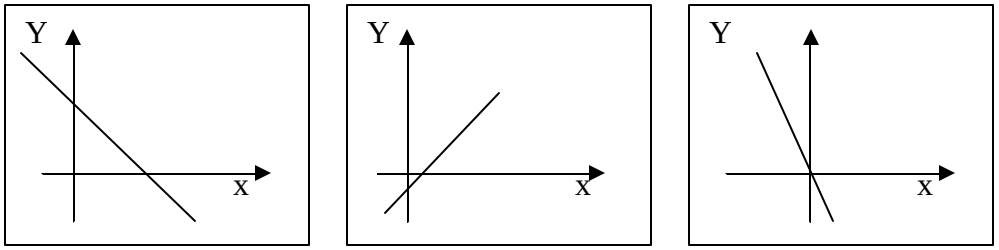
a. Assuming the weight is growing at a linear rate, find a formula that gives the weight "W" (in kilograms) in terms of the number of days "D

b. What are the units of the slope and what does it mean in this problem.

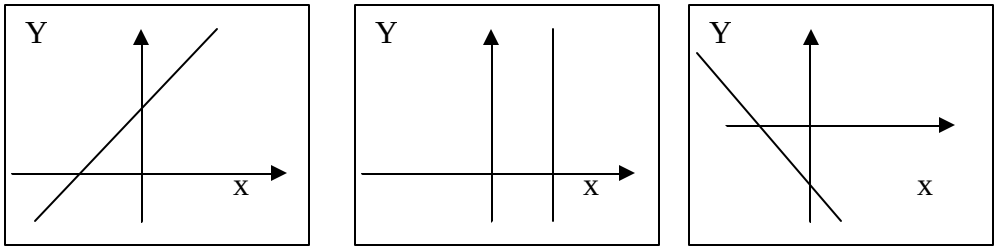
Exercise #8 Match the graphs (I) – (VI) with the equations given below. (You shouldn't need to graph each equation to determine which is which!) NOTE: The x and y scales may be unequal. Show all work.

a. $y = .005x + .009$ b. $x = -py$ c. $y = \frac{5}{2} - \frac{3}{4}x$ d. $x - \sqrt{1000} = 0$ e. $3x + 4y + 10 = 0$

f. $y = 351x - 140$



(I) (II) (III)



(IV) (V) (VI)

Exercise #9 At a University, campus food services decides to sell gourmet coffee from a cart in front of the library. The table below is a projection of the cost to the university of selling various amounts of coffee.

Total cost to serve *x* cups of coffee in a day

x (cups)	0	5	10	50	100	200
C (dollars	50.00	51.25	52.50	62.50	75.00	100.00

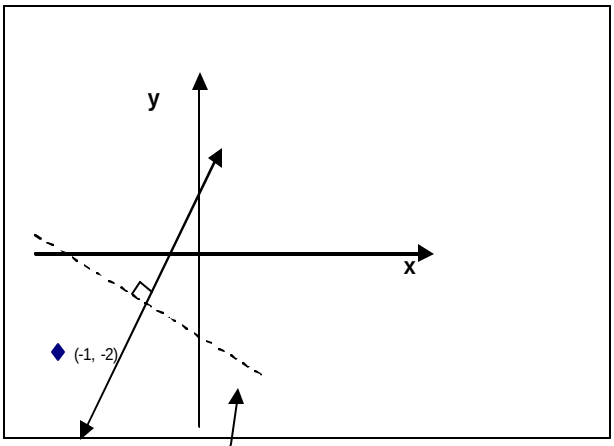
a) Using the table, show that the relationship is linear.
b) Plot the data found in the table.
c) Find the slope of the line. Explain what this means in the context of the given situation.
d) What will it cost to serve 13 cups of coffee in a day?

Exercise #10 Are the lines given by these equations parallel, perpendicular or neither?

$y - \frac{2}{3}x = 0$; $3y = 2x + 1$.

Exercise #11 Find an equation of the line that passes through the point (-1,2) and is perpendicular to $\frac{5}{18}x + \frac{1}{6}y = \frac{2}{3}$.

Exercise #12 Find the equation of the solid line graphed below.



$$\frac{1}{2}x+\frac{5}{4}y+2=0$$

Exercise #13 (2.4 - # 62, 64) Find the slope of the line passing through each pair of points or state that the slope is undefined. Assume that all variables represent positive real numbers.

a) $(-a,0)$ and $(0,-b)$ b) $(a-b,c)$ and $(a,a+c)$

Exercise #14 Write the slope-intercept equation of a function *f* whose graph passes through (-5,6) and is perpendicular to the line that has an *x*-intercept of 3 and a *y*-intercept of -9.

Exercise #15 (2.4 - #75) A linear function that models data is described. Find the slope of each model and its meaning.

a) $f(x)=0.01x+57.7$ models the global average temperature of Earth, $f(x)$, in degrees Fahrenheit, *x* years after 1995.

Exercise #16 (2.4 - # 82) The scatter plot shows the number of college students in the United Stated, in thousands, enrolled exclusively in online education from 2002 through 2007. Also shown is a line that passes through or near the six data points.

a) Use the coordinates of the two points to compute the slope of the line. Describe the meaning of the slope.
b) Write a linear function that models the number of college students enrolled exclusively in online education, in thousands, *x* years after 2002.
c) Predict the number of college students who will be enrolled exclusively in online education in 2010.