Instructions: *Complete these problems for homework due on the date above. The problems should look very similar to those that were covered during our class meeting covering §5.4-5.6.*

1. Give the equation of the line with the desired characteristics. The final form of every line must be slope-intercept form, unless it is not possible to write in that form. If a y-intercept is not given, point-slope form must be used. A graph may not be used to show work.
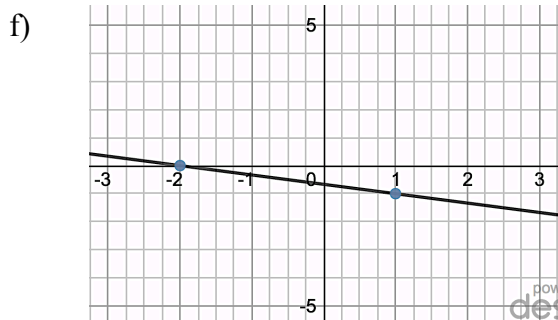
a) With $m = {}^5/_3$ through (9, -1)

b) Through (-4, 3) and parallel to $2y - 3x = -1$

c) Perpendicular to $2x - 5y = -9$ through (-2, -3)

d) Through (-2, 2) and (5, -6)

e) Through (6, 3) and (6, -2)

f)

2. Let s be a person's stock investment (in 100's of stocks) at t years since 1993. Some pairs of values of *t* and *s* are listed in the table below. Find an equation to describe the relationship between *t* and *s*.

Years *t*	Stocks (in 100's) *s*
3	6
5	11
9	21
11	26

3. Using function notation, find an equation to represent the total cost (in dollars) of a tank full of gasoline when gas costs $3.15 per gallon. Use **T** for the total cost and **n** for the number of gallons of gas in a full tank. After you have found a function, use function notation to find the total cost of 11 gallons of gas.

4. The number of US patent applications was 525 thousand in 2010 and 594 thousand in 2013. Use **P(t)** to represent the number US patents as a function **t** years since 2007.

a) Using the fact that in 2010 there were 525 thousand patents and in 2013 there were 594 thousand patents, find the linear function P(t).

b) Predict the number of patents this year, 2015. Show your prediction using function notation.

c) Interpret the meaning of the slope in this model?

d) Find and interpret the meaning of the P(0) in this model?

5. Answer the questions that relate to the following scenario.

*In August my bank charged me $8.75 for writing 15 checks and in September the charge for 20 checks was $9.00. Consider charge for my checking privileges to be **c** and number of checks to be **n**.*

a) Find a model to describe the charge for my checking privileges as a function of number of checks written.

b) Use the model to find the charge for writing 50 checks.

c) What is the y-intercept? Interpret it using units.

6. For $g(t) = 2t - 5$ find $g(3m - 4)$ & $g(t) = 19$

7. Create a scatterplot for the data. Draw a straight line that comes as close to as many points as possible and <u>create a model for the data</u>. Highlight 2 points that you use to create the model.

x	y
3	18
5	16
8	12
9	10
11	8