Practice Exam 1

1) write equation for marginal product of capital for each of the following production
a) $Q = 3K + 2L$

b) $Q = 4K^{0.5}L$

c) $Q = 5K^{0.5}L - L$

2) Consider the following production function $Q = 5KL^{0.5} - L$, and assume that capital is fixed at two units. At what point does $MP_L$ reach zero?

3) Suppose inputs are only substitutable at two units of labor for every one unit of capital. What would be the equation for the production function? What is the average and marginal product of labor in this case?

4) Suppose $I = 20$, $p_c = 2$, $p_d = 0.5$, draw your Budget Constrain.

Now suppose you clipped a coupon out of the newspaper and took it with you to the store. The grocery store coupon allows you to buy all of the chips you care to buy at $0.5 (per bag) below the store price. Draw your new BD (with the coupon) in the graph above. Label it $I_2$.

5) Assume your utility is given by $U = \min(1D, 2C)$. Draw your IC for $U = 10$. Identify the values of C and D for 2 different points on the IC for $U = 10$, one of which is for $D = 10$. 
6) Based on information provided, Jill will be made happier if Jack: a) play another CD, b) serves Jill another glass of beer, c) gives Jill another ounce of popcorn, d) buy her flowers. Justify your answer.

7) Does Jill regard beer as normal or inferior goods? Explain/justify your answer.

8) Draw Jill’s IC for \( U = 100 \) if \( M \) is fixed at \( M = 10 \). (Hint: you may want to derive the equation of this curve first)

9) How much additional utility will Jack obtain by consuming another glass of beer if \( M \) is fixed at \( M = 9 \), \( P \) is fixed at \( P = 16 \), and he has just finished drinking his 4th glass of beer?
10) In the figure below, for a given consumer assume 1) the line “aa” represents an original budget line (before tax), 2) the line “ba” represents a new budget line (after tax). What type of tax that has been imposed? Explain when this tax would not lower the given consumer’s utility.

(insert figure)

11) Assume that, given a consumer’s utility function, x = hamburgers, and y = French fries, the optimal quantities of burgers and fries are such that x = 2y. If the consumer’s income constraint is $10, Px = 2 and Py = 1, what is the utility maximizing consumption levels of x and y.