Econ 1 M10
Quiz 5 Name_____ Perm_____

1. There are two identical firms that sell purple sugar water. The firms can either collude and both set the monopoly price of $18, or either firm can cheat by setting a price of $10. The firm's payoffs can be summarized in the game matrix below, where the first entry in each cell is Firm A's profits, and the second entry is firm B's profits.
   Underline the profit corresponding to the best response for each firm, and circle the Nash equilibrium.

		Firm B	
		P=$18	P=$10
Firm A	P=$18	$72, $72	$0, $80
	P=$10	$80, $0	$40, $40

2. The table below shows Tubby's production of ice cream. Use this information to fill out the Marginal Product (MP), Revenue, and Value Marginal Product (VMP) columns, if Tubby's can sell its ice cream for $3 per tub.

N (number of workers)	Q (tubs of ice cream)	MP	Revenue	VMP
0	0	----------	$0	----------
1	200	200	$600	$600
2	700	500	$2100	$1500
3	900	200	$2700	$600
4	1000	100	$3000	$300
5	1050	50	$3150	$150
6	1050	0	$3150	$0

3. How many workers will Tubby's want to hire if the wage is $250 per worker?
   4

   Suppose there are 100 identical firms that produce grapes, each with a production function of $q_i(n_i) = 30n_i - \frac{n_i^2}{4}$, where q_i is measured in pounds of grapes. Therefore, each firm has a marginal product of $MP_i(n_i) = 30 - \frac{n_i}{2}$. Grapes can be sold for $2 per pound.

4. The total market demand for grape-worker labor is:
   N = **6000** - **100** W
   where W is the wage in dollars, and N is the number of workers hired.

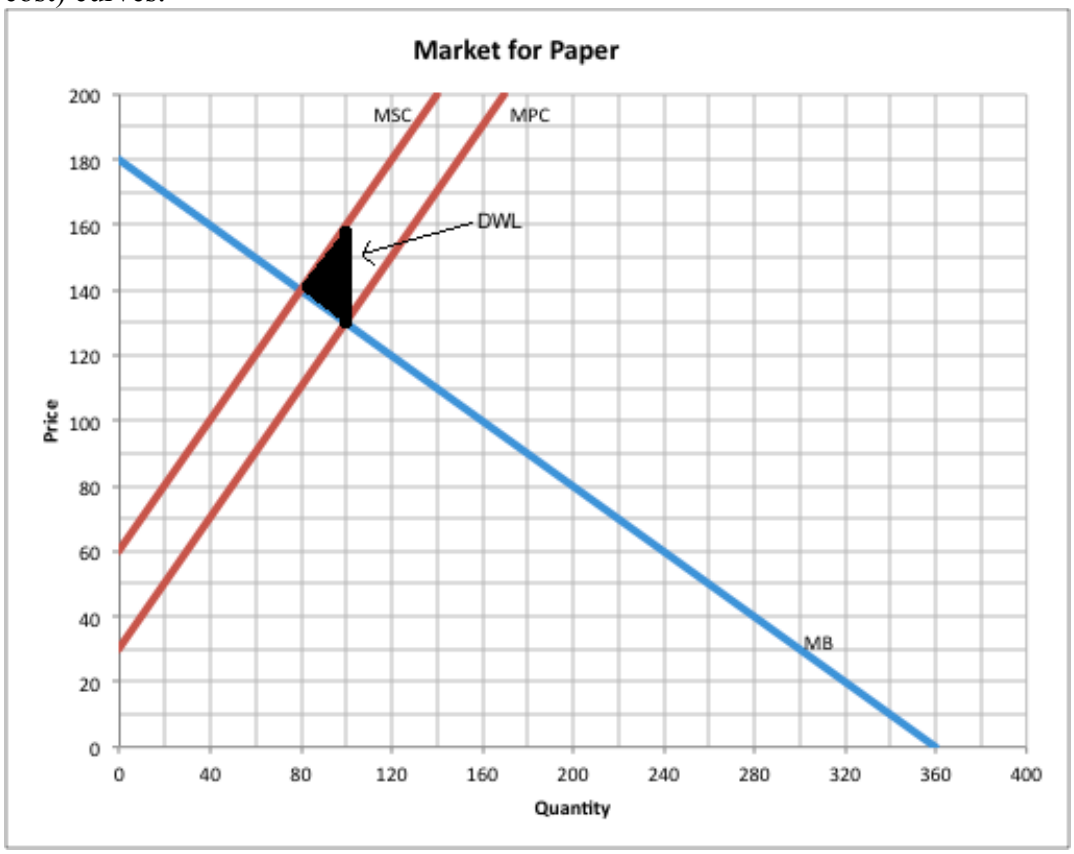
5. If there are 5000 grape-workers workers that are willing to work for any wage, the equilibrium wage will be ____**$10**__. (Hint: the supply curve is perfectly inelastic at 5000).

   Suppose the market for paper is perfectly competitive, but producing paper causes a significant amount of pollution. The market fundamentals are:

$$MB = 180 - \frac{Q}{2}$$
$$MPC = 30 + Q$$
$$MEC = 30$$

   Where MB is marginal benefit, MPC is marginal private cost, and MEC is marginal external cost.

6. Use the information above to graph the MB, MPC, and MSC (marginal social cost) curves.



7. If this market were unregulated, and firms only considered their private costs, the equilibrium quantity would be ___**100**____, and the equilibrium price would be __**$130**___.
8. The socially optimal quantity of paper is _____**80**____.
9. The deadweight loss caused by the negative externality is _____**$300**____. Shade this area on your graph.
10. In order to get to the socially optimal quantity, the government could impose a tax of ____**$30**___ per unit.