SECOND TEST. ECON 100B, SPRING 2015.   NAME: _____

Fill in the blanks, and answer in the spaces provided. Show your work.

1. Monopoly. In the market for squashed potatoes, cost and benefit are defined by the marginal benefit and marginal cost functions $MB = 200 - 2q$ and $MC = 50 + q$.

a) If the industry is perfectly competitive, then the equilibrium quantity will be _____, the equilibrium price will be _____, consumer surplus will be _____, producer surplus will be _____, and total economic surplus will be _____.

b) If supply is controlled by a monopolist with marginal revenue $MR = 200 - 4q$, then the equilibrium quantity will be _____, the equilibrium price will be _____, consumer surplus (CS) will be _____, producer surplus (PS) will be _____, total economic surplus (TES) will be _____, and deadweight loss (DWL) will be _____.

c) On the graph to the right, draw and label the MB curve, the MC curve, and the MR curve. Show both the competitive (optimal) quantity and price, and the monopolist's quantity and price. For the case with the monopoly (not the competitive case), shade the areas representing CS, PS, and DWL. (Use different shading to distinguish the different areas.)
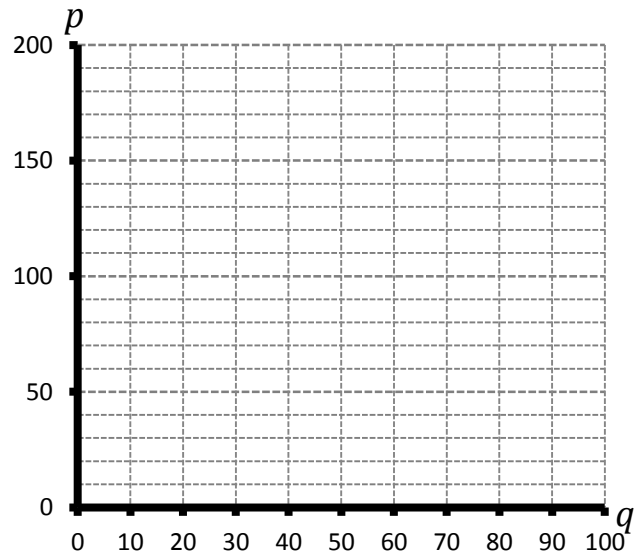
d) In clear terms, define marginal revenue, and explain why the monopolist's marginal revenue curve is below the marginal benefit (or demand) curve.

2. Public good. Four roommates are deciding how many Nintendo games to get for their house. Suppose that Nintendo games are pure public goods for them, and that each game costs $50. Each roommate has the same individual total benefit schedule, given in dollar amounts in the column below marked TB_i.

a) Fill in the missing information in the table below, i.e. the columns for MB_i (marginal individual benefit) MSB (marginal social benefit), TSB (total social benefit), TC (total cost), and TES (total economic surplus).

b) If there is no possibility of collective action, and each roommate must decide privately how many Nintendo games to buy, then the equilibrium quantity will be ____**3**____, and total economic surplus will be ____**690**____.

c) However, the socially optimal quantity of Nintendo games is ____**6**____, in which case total economic surplus will be ____**900**____.

Q	TB_i	MB_i	TSB	MSB	TC	TES
1	80	80	320	320	50	270
2	150	70	600	280	100	500
3	210	60	840	240	150	690
4	250	40	1000	160	200	800
5	280	30	1120	120	250	870
6	300	20	1200	80	300	900
7	310	10	1240	40	350	890
8	315	5	1260	20	400	860

d) On the graph to the right, draw the marginal individual benefit (MB_i) and marginal social benefit (MSB) 'curves'. Mark the equilibrium without coordination (y^*) and the optimum (y^o). Shade in the area that represents the *difference* in economic surplus between the uncoordinated equilibrium and the optimum.
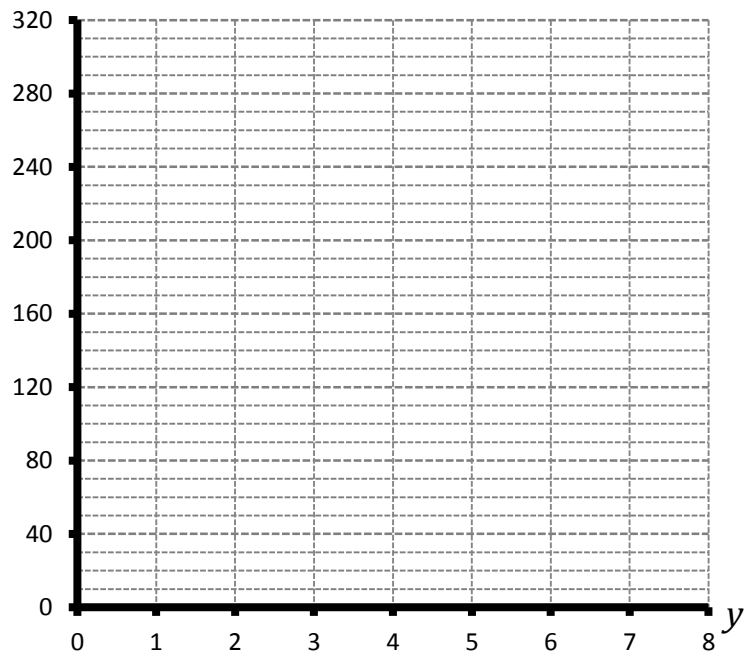
3. Negative externality. Suppose the market for a certain good (e.g. 'gasoline') is perfectly competitive, but that the good causes a negative externality. Marginal private benefit, marginal private cost, and marginal external benefit are given by the functions below:

$$MB = 90 - \frac{3}{10}q \qquad MC = 10 + \frac{1}{10}q \qquad MEC = 40$$

a) No policy. Given that there is no policy to address the externality, find the equilibrium quantity, price, consumer surplus, producer surplus, external cost, and total economic surplus.

$q^* =$ _____ $\qquad p^* =$ _____ $\qquad CS^* =$ _____

$PS^* =$ _____ $\qquad EC^* =$ _____ $\qquad TES^* =$ _____

b) Pigovian tax. To maximize total economic surplus, the government should impose a tax of $\tau^o =$ _____ per unit. Given this, find the equilibrium quantity, price, consumer surplus, producer surplus, external cost, government revenue, and total economic surplus.

$q^o =$ _____ $\qquad p^o =$ _____ $\qquad CS^o =$ _____

$PS^o =$ _____ $\qquad EC^o =$ _____ $\qquad GR^o =$ _____ $\qquad TES^o =$ _____

c) Graphing. On the left, graph the market with no policy intervention, labeling CS^*, PS^*, EC^*, and deadweight loss (DWL). On the right, graph the market with the subsidy, labeling CS^o and PS^o.

with no policy intervention

p

90
80
70
60
50
40
30
20
10
0

0   50   100   150   200   250   300 q

with Pigovian tax

p

90
80
70
60
50
40
30
20
10
0

0   50   100   150   200   250   300 q
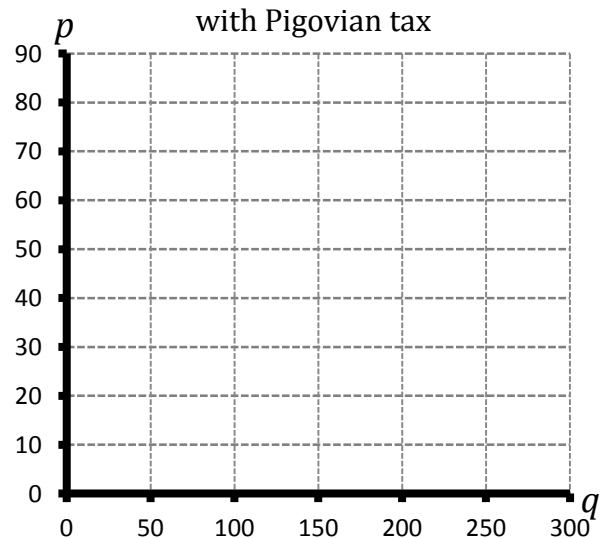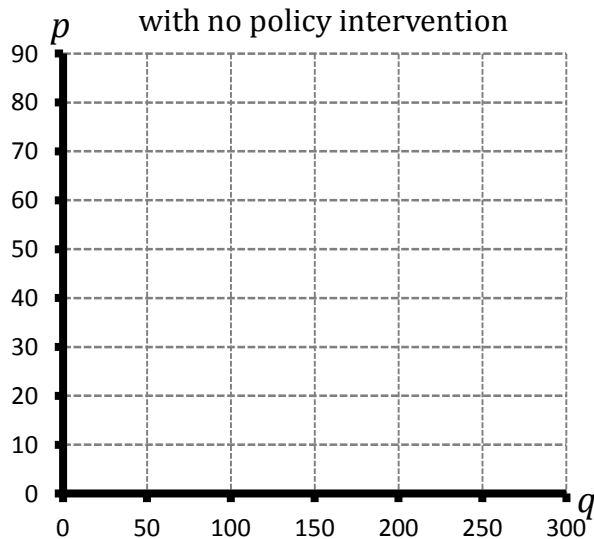
4. Reflection questions

a) Give the 'textbook' definition for a public good, explaining each term carefully.

b) Give an example of a public good that fits the above definition well. Explain how it fits the definition, and explain clearly why the market for this good would likely be inefficient in the absence of government intervention.

c) In the negative externality problem above, who is made better off by the Pigovian tax? By how much are they made better off, altogether?

d) Who is made worse off by the Pigovian tax? By how much?

e) Which is greater: the sum of the gains by those made better off, or the sum of the losses by those made worse off? Explain clearly why this is true in general for a Pigovian tax.