

FIRST TEST. ECON 100D, FALL 2013. NAME: _____

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

1. Demand (discrete). The table below gives Stan's total benefit from DVDs in dollar amounts (TB), given the number of DVDs he buys (q). The price of DVDs is \$20.

q	TB	MB
1	40	
2	71	
3	94	
4	110	
5	120	
6	125	
7	126	

TE	CS

- a) Fill in the MB column with Stan's marginal benefit from each last DVD.
- b) Fill in the TE (total expenditure) and CS (consumer surplus (cumulative)) column with Stan's total expenditure on DVDs and his consumer surplus.
- c) On the blank graph above, draw Stan's demand 'curve' (actually more of a staircase shape), and a line representing the price. Shade the area that represents Stan's consumer surplus given the optimal quantity.
- d) Using the information above, describe two distinct ways of determining the quantity of DVDs that is optimal (surplus-maximizing) for Stan to purchase, and explain why they are equivalent.

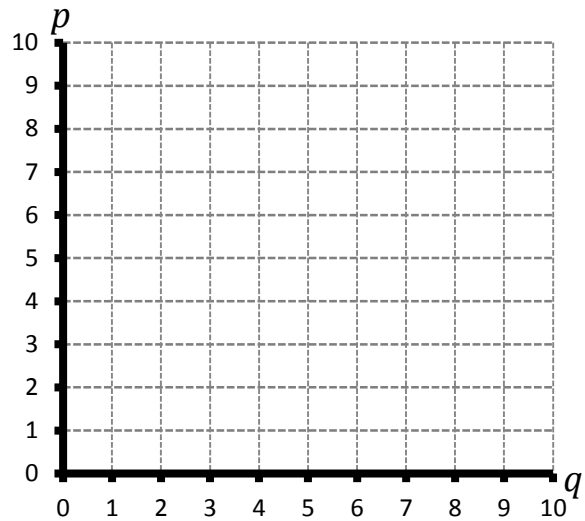
2. Supply (continuous). Larry makes money by growing purple fungus. His total cost of growing fungus is given by the function $TC = 2q + \frac{1}{4}q^2$, and his marginal cost is given by $MC = 2 + \frac{1}{2}q$, where q is the quantity of fungus he grows, in bucketfuls.

a) Larry's supply function is $q_s = \underline{\hspace{2cm}} + \underline{\hspace{2cm}}p$

For the rest of the problem, suppose that the price of fungus is $p = 5$.

b) At this price, Larry's optimal quantity is $q^* = \underline{\hspace{2cm}}$, and his resulting producer surplus is $PS = \underline{\hspace{2cm}}$.

c) On the blank graph to the right, draw Larry's supply curve, and a line representing the price. Shade in the area that represents Larry's producer surplus given his optimal quantity.



d) Explain clearly why the value of q^* you found maximizes producer surplus. Why would either a lower quantity $q < q^*$ or a higher quantity $q > q^*$ clearly lead to less producer surplus?

3. Elasticity. Suppose that the market demand for floo powder is given by the function $Q_d = 1000 - 50p$.

a) Find ϵ_d , the price elasticity of demand for floo powder, at a price of $p = 5$.

b) In what way is the price elasticity of demand a more useful measure of the sensitivity of demand to price than the (inverse) slope of the demand curve, i.e. $\Delta Q_d / \Delta p$?

4. Excise tax. Demand and supply in the market for spicy sauce (which is perfectly competitive, etc.) are determined by the marginal benefit function $MB = 70 - q$ and the marginal cost function $MC = 10 + \frac{1}{2}q$, where q is the quantity of spicy sauce.

For parts (a) and (b), suppose that there is no tax.

a) In the market equilibrium, the price is $p^* =$ _____, and the quantity is $q^* =$ _____.

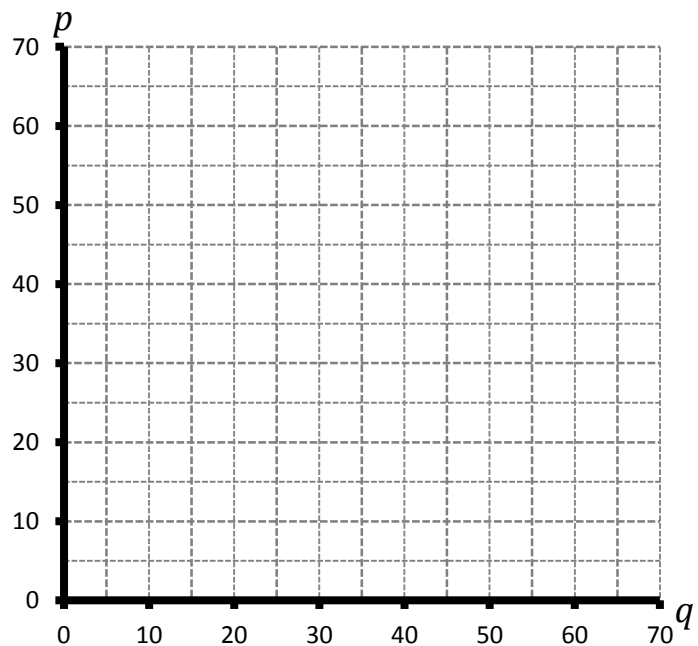
b) Consumer surplus is $CS =$ _____, producer surplus is $PS =$ _____, and total economic surplus is $TES =$ _____.

Part parts (c) through (e), suppose that there is a tax of \$15 per unit.

c) In the market equilibrium, the price is $p^* =$ _____, and the quantity is $q^* =$ _____.

d) Consumer surplus is $CS =$ _____,
producer surplus is $PS =$ _____,
government revenue is $GR =$ _____,
total economic surplus is $TES =$ _____,
and deadweight loss is $DWL =$ _____.

e) On the blank graph to the right, draw the demand curve, supply curve, and the supply curve with the tax. Use different colors or patterns to shade in consumer surplus, producer surplus, government revenue, and deadweight loss.



f) With the imposition of this tax, why is more lost in consumer and producer surplus than what is gained in government revenue?

5. Price floor. Demand and supply in the market for mystical soda (which is perfectly competitive, etc.) are determined by the marginal benefit function $MB = 60 - 3q$ and the marginal cost function $MC = 20 + q$, where q is the quantity of mystical soda.

For parts (a) and (b), suppose that there is no price control.

a) In the market equilibrium, the price is $p^* =$ _____, and the quantity is $q^* =$ _____.

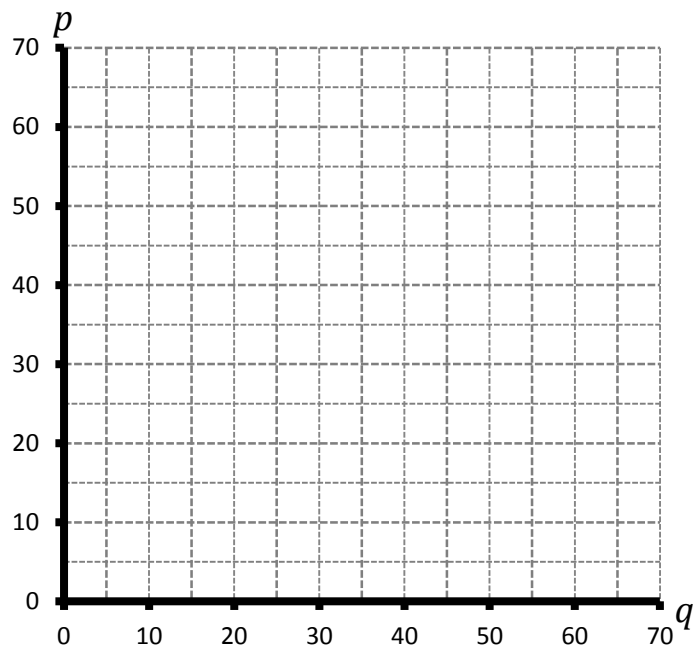
b) Consumer surplus is $CS =$ _____, producer surplus is $PS =$ _____, and total economic surplus is $TES =$ _____.

Part parts (c) through (e), suppose that there is a price floor of \$36 per unit.

c) In the market equilibrium, the price is $p^* =$ _____, and the quantity is $q^* =$ _____.

d) Consumer surplus is $CS =$ _____, producer surplus is $PS =$ _____, total economic surplus is $TES =$ _____, and deadweight loss is $DWL =$ _____.

e) On the blank graph to the right, draw the demand curve, supply curve, and the price floor. Use different colors or patterns to shade in consumer surplus, producer surplus, and deadweight loss.



f) If the price floor is removed, *why* do we expect the market equilibrium price to return to its value in part (a)? Or, in other words, why is this an equilibrium in the first place? Try to explain as clearly as possible why alternative prices cause market pressures that push in the direction of this value.

g) Further, explain why the market equilibrium in (a) is Pareto efficient, such that no one can be made better off without someone else being made worse off.

6. Aggregate demand. Suppose that, in the market for green slime, there are 100 consumers, each with the same marginal benefit function, $MB_i = 10 - 2q$.

a) Each individual consumer has the demand function $q_{d_i} = \text{_____} - \text{_____}p$.

b) Aggregate demand is given by the function $Q_d = \text{_____} - \text{_____}p$.

16. Opportunity cost Suppose that Judy has a country house, and she is deciding how many weekends to spend there this summer. The bottom row in the table below gives the total benefit (in dollar amounts, and not taking cost into account) that she will get from going to the house for different numbers of weekends. For every summer weekend that she doesn't go to the house, she can get \$500 of income by renting it to someone else. Travel to and from the house costs \$100 per weekend.

weekends	1	2	3	4	5	6
total benefit	\$700	\$1200	\$1600	\$1900	\$2100	\$2150

a) How many weekends should she spend there? _____

b) Define opportunity cost. How can it be different from the amount you have to pay to get something?