Problem Set 3, due Tuesday, March 1ˢᵗ, 2016

Opportunity cost

1. 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 $200 of income by renting it to someone else. If travel to and from the house costs $100 per weekend, how many weekends should she spend there? _____

weekends	1	2	3	4	5	6
total benefit	$550	$1000	$1350	$1600	$1750	$1800

2. Same problem with different numbers. Rental income for one weekend is $500; travel cost is $100.

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

a) How many weekends should she spend there? _____

3. Building a park in an empty lot owned by the city will cost $10,000 in construction, landscaping, etc. There are 300 people who would benefit from the park, and each of them would be willing to pay a maximum of $100 to have it. A private developer is willing to pay $X to the city to acquire the same land, if the park isn't built. Assuming that public money will be spent on worthwhile things, ignoring distributional issues, etc., then the park should be built at long as X is less than _____.

4. I have four choices of what to do this afternoon: go to work, see a movie, go out to lunch, or go to the park. Fill in the missing values in the table below.

	work	movie	lunch	park
money effect, ME	+50	-10	-20	0
happiness effect, HE	-5	+50	+70	+35
total effect, $TE = ME + HE$				
implicit cost, IC				
$TE - IC$				

5. Same problem with different numbers. Fill in the missing values in the table below.

	work	movie	lunch	park
money effect, ME	+60	-15	-25	0
happiness effect, HE	-15	+55	+60	+50
total effect, $TE = ME + HE$				
implicit cost, IC				
$TE - IC$				

Shifts in supply and demand

6. Suppose that the market for wine behaves like a typical, perfectly competitive, 'textbook' supply and demand model, with smoothly increasing marginal cost and decreasing marginal benefit. Fill in each of the blanks below with "up" or "down".

a) If the supply curve shifts to the right, equilibrium price of wine will go _____, and equilibrium quantity will go _____.

b) If grapes (an input in wine production) become more expensive, we would expect the equilibrium price of wine to go _____ and the equilibrium quantity of wine to go _____.

c) Suppose that wine and beer are substitutes. If the price of beer decreases, we would expect the equilibrium price of wine to go _____ and the equilibrium quantity of wine to go _____.

7. Same problem, but with peanut butter instead of wine.

a) If a new invention reduces the cost of producing peanuts, we would expect the equilibrium price of peanut butter to go _____ and the equilibrium quantity of peanut butter to go _____.

b) Suppose that peanut butter and jelly are complements. If the price of jelly decreases, we would expect the equilibrium price of peanut butter to go _____ and the equilibrium quantity of peanut butter to go _____.

Summing demand and supply curves

8. 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 $q_{d_i} =$ _____ − _____p.

b) Market demand is given by the function $Q_d =$ _____ − _____p.

c) This could also be represented by the market-level marginal benefit function $MB =$ ____ − ____q.

9. Suppose that, in the market for green slime, there are 20 consumers, each with the same marginal benefit function, $MB_i = 6 - \frac{1}{10}q$.

a) Each individual consumer has the demand function $q_{d_i} =$ _____ − _____p.

b) Market demand is given by the function $Q_d =$ _____ − _____p.

c) This could also be represented by the market-level marginal benefit function $MB =$ ____ − ____q.

10. Suppose that, in the market for green slime, there are 10 producers, each with the same marginal cost function, $MC_i = 4 + \frac{1}{10}q$.

a) Each individual producer has the supply function $q_{s_i} =$ _____ + _____p.

b) Market supply is given by the function $Q_s =$ _____ + _____p.

c) This could also be represented by the market-level marginal cost function $MC =$ ____ + ____q.

Elasticity

11. Suppose that the market demand for floo powder is given by the function $Q_d = 1000 - 50p$. Find ε_d, the price elasticity of demand for floo powder, at a price of $p = 5$.

12. 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. $\Delta Q_d / \Delta p$?

13. Suppose that the market demand for cotton candy is given by the marginal benefit function $MB = 10 - \frac{1}{4}q$. Find ε_d, the price elasticity of demand for cotton candy, at a price of $p = 5$.