The Digital Economist

Intermediate Microeconomics
Worksheet #3: **Consumer Behavior & Demand** Name:_____

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1. (Price elasticity of demand) Market Demand and Supply equations for lodging at a local ski resort are as follows:

   $\mathbf{Q}_d = 200 - \mathbf{P}$
   $\mathbf{Q}_s = 125$ {a fixed number of rooms are available}

   a. Calculate the equilibrium room price.

   b. At this equilibrium price, what is the level of Sales Revenue?

   c. If this particular lodge were to add one more room ($\mathbf{Q}_s$' = 126), what would be the effect on market price? How would this change affect Sales Revenue? Given these results, would you conclude that demand is *Price Elastic* or *Price Inelastic*?

   d. Calculate the percentage change in price and quantity ($\%\Delta P$, $\%\Delta Q_d$) by adding this one room. Calculate the Price Elasticity of Demand.

   e. If the goal of the lodge owners is to increase Sales Revenue, should they add rooms or eliminate some of the rooms currently available. Explain your answer.

   f. What price and quantity combination would *maximize* Sales Revenue?

2. (refer to: http://www.digitaleconomist.com/elas2.html to answer this problem) Given the following demand equation estimated by Pan Pacific Airlines for economy-class tickets:

$$Q_d = 150P_x^{-1.25} M^{1.50} P_y^{-0.50} P_z$$

where:

- Q_d -- Quantity Demanded of Economy-class tickets/week
- P_x – Price of an Economy-class ticket
- M – Per-capita Income
- P_y – Price of a Bus ticket
- P_z – Nightly Hotel Room Rate

a. Given this equation, Economy-class tickets are Price (*Elastic/ Inelastic*):_____, a (*Normal/Inferior*)_____ good, a (*Complement/Substitute*)_____ for Bus Tickets, and a (*Complement/Substitute*) _____ for Hotel Rooms.

Question #2 (cont.)
b. Holding all other variables constant, if market price increases by 5%, Quantity Demanded will change by _____% and Total Consumer Expenditure will (*rise/fall*):___.

c. What Exogenous variable(s) are indirectly measured by the constant term (150) in the above equation?_____

d. Suppose that Pan-Pacific Airlines is at full capacity (i.e., the airline cannot accommodate any additional passengers). However, GDP (national income) is expected to increase by 6% next year and population will grow by 2%. What will be the corresponding change in per-capita income?_____

e. Given this change in Per-Capital Income, by how much will Quantity Demanded change?_____

f. How exactly can management of Pan-Pacific Airlines offset this expected growth in demand?_____

3. (Consumer's Surplus) Given the following equation for an Individual Demand Curve for ski lift tickets (Quantity demanded per season):

   $\mathbf{Q_D} = 20 - 0.25\mathbf{P}_{mkt}$

   a. Assuming that lift tickets must be consumed in integer quantities, calculate the following for a market price of $40:
      - The Total Value of Consumption
      - Total Consumer Expenditure
      - Consumer's Surplus

   b. How will an increase in the market price to $44 affect your answers in part 'a'?
   c. Calculate the change in consumer welfare (Consumer's surplus) do to this change.

4. (Excise taxes) Given the following equations:

Market #1		**Market#2**
P = 20 - 0.5**Q**	{inverse demand}	**P** = 15 - 0.375**Q**
P = $10	{any amount is supplied .at a price of $10}	**P** = $10

a. How would you explain the difference in the slopes of the above two demand curves?

b. Graph these equations and calculate the size of *Consumer's Surplus* at the equilibrium price of $10.

Market #1: CS = _____
Market #2: CS = _____

c. Graphically show the impact of the imposition of a $2/unit excise tax on each market.

d. Calculate the following:

	Market #1	**Market #2**
1) Change in Consumer's Surplus:	_____	_____
2) Tax Revenue Collected:	_____	_____
Difference between 1) and 2):	_____	_____

e. Provide an interpretation of this difference between the dollar change in consumer welfare (Consumer's Surplus) and tax revenue collected.

f. Which market is preferred for the imposition of this type of tax? Explain why.