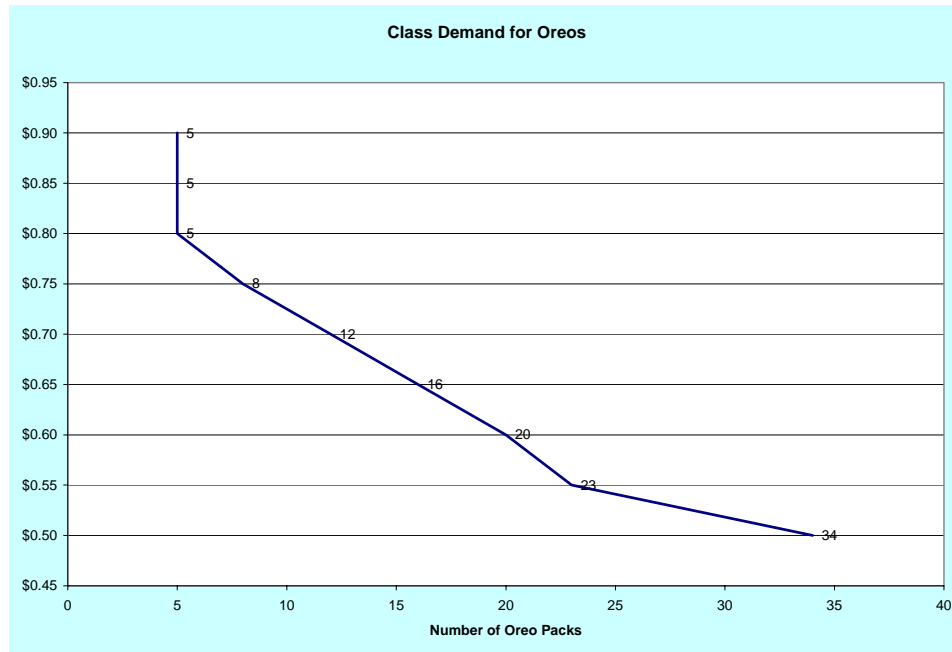


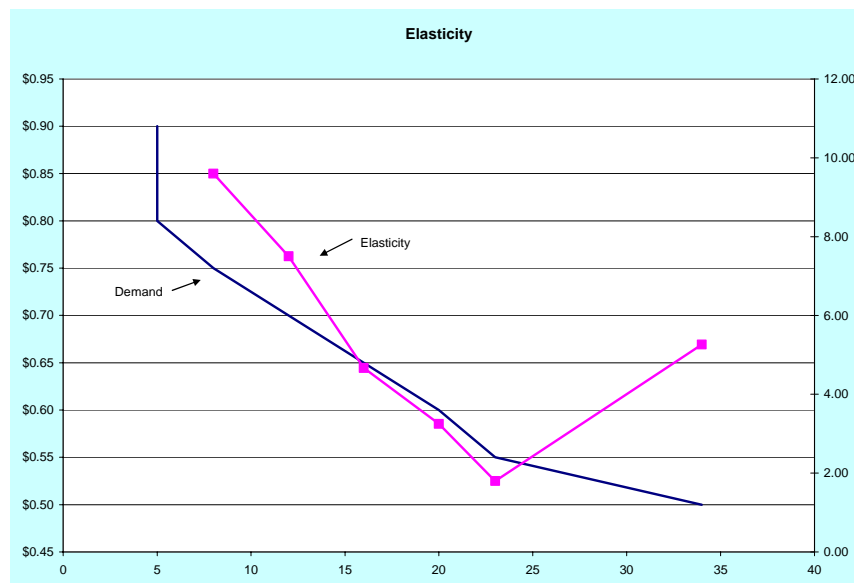
Graded Assignment Question 5 Key

1. Use the cookie demand data from the provided excel spread sheet to answer the following questions.
 - a. Graph the demand schedule for cookies making sure that price is on the vertical axis and quantity on the horizontal axis. Display the graph and describe how it differs from the “text book” straight line demand schedule. I did not graph the demand schedule as a stair step because the point of the exercise is not reservation prices.



- b. Compute the elasticity of demand at each price. Create a graph where you show the elasticity of demand at each point on the demand schedule. Display the graph and describe how it differs from the graph you would obtain for the text book straight line demand schedule.

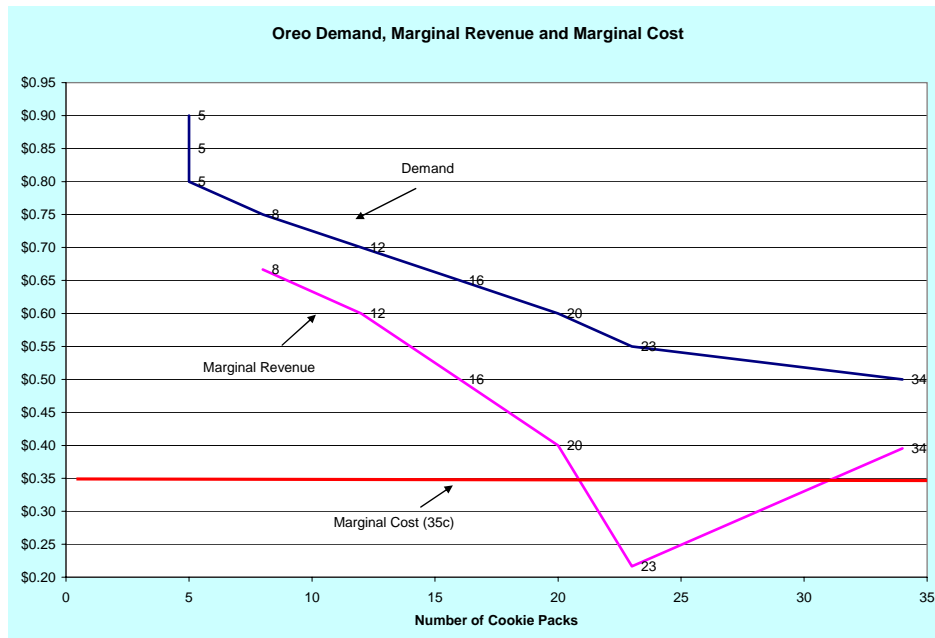
*To compute elasticity one must use finite differences. There are a variety of valid formulas all of which are approximations to the infinitesimal difference formula that is theoretically appropriate. I calculated elasticity as $(-1.0) * (Q(new) - Q(old)) / Q(old)$ divided by $(P(new) - P(old)) / P(old)$.*



The graph differs from the standard graph based on a straight line demand curve. For the straight line demand schedule, elasticity declines monotonically as quantity demanded increases. In the case of our cookie pack demand schedule, Elasticity falls and then rises. Demand never becomes inelastic in the range of prices included in the market survey.

- c. Use excel to compute marginal revenue at each point on the demand schedule. Create a graph in which you display marginal revenue at each point on the demand schedule. Display the graph and describe how it differs from the graph you would obtain for the text book straight line demand schedule.

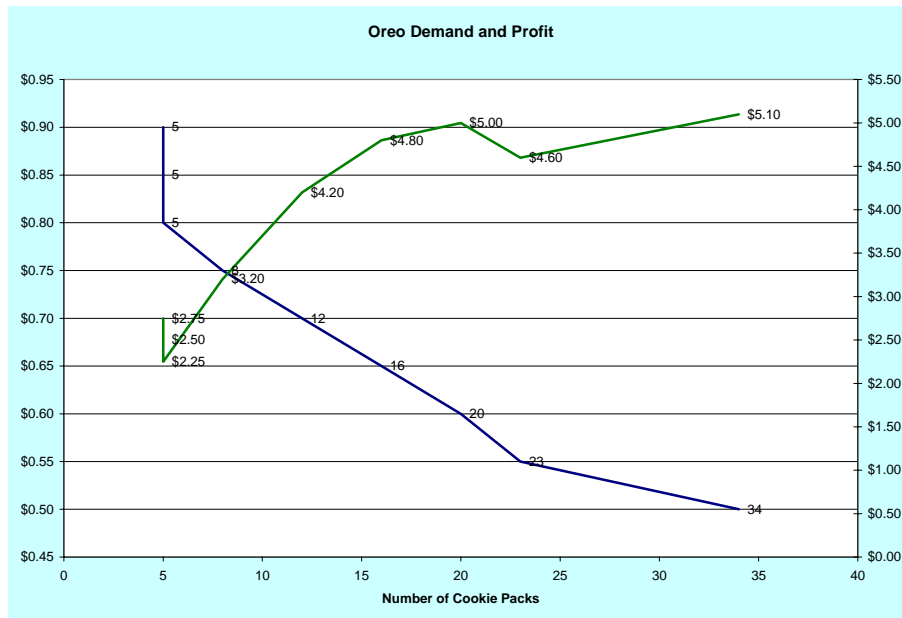
Again, one must use differences to compute the change in revenue. It is important to divide the change in revenue by the change in quantity in order to obtain “per unit values” that can be reasonably compared to marginal cost. The graph I obtain is



Unlike the straight line demand schedule case, we do not have marginal revenue monotonically decreasing. The profit maximizing price and quantity are not obvious from the above graph.

- d. Suppose Michael Salemi wishes to maximize profit and can buy all the Oreo cookie packs he wants at a constant marginal cost of \$0.35. Suppose that Salemi must sell cookies at the same price to all students. What price should Salemi charge? How many cookie packs will he sell? Support your conclusions by specific reference to the data and to calculations you make using the data.

Because marginal revenue does not continue to fall as quantity increases, we should not blindly look for the quantity where marginal cost equals marginal revenue. The following graph computes profit for every point on the demand schedule assuming a constant marginal cost of \$0.35.



The highest profit occurs for a quantity of 34 cookie packs and a price of \$0.50 per pack.

- e. Suppose Michael Salemi wishes to maximize profit and can buy all the Oreo cookie packs he wants at a constant marginal cost of \$0.35. Suppose that Salemi can divide students into two groups and sell at a different price to members of each group. That is, all students in Group A will pay the Group A price and all students in Group B will pay the Group B price. How should Salemi define the groups? What price should he set for Group A? Group B? How many cookie packs will he sell to Group A? Group B? Support your conclusions by specific reference to the data and to calculations you make using the data.

There is no one right way to do this. I will be interested to see what you came up with. My instincts tell me that one group should contain all those students willing to pay \$0.75 or more to obtain a package of cookies and the other around all other students.

Suppose we put student C, F and L in one group and the remaining students in the other group. It will be optimal to charge the first group \$0.90 and the second group \$0.50. The profit functions of the two group are given by the following tables.

First Group				Second Group			
Quantity Demanded	Price	Revenue	Profit	Quantity Demanded	Price	Revenue	Profit
5	\$0.90	\$4.50	\$2.75	0	\$0.90	\$0.00	\$0.00
5	\$0.85	\$4.25	\$2.50	0	\$0.85	\$0.00	\$0.00
5	\$0.80	\$4.00	\$2.25	0	\$0.80	\$0.00	\$0.00
6	\$0.75	\$4.50	\$2.40	2	\$0.75	\$1.50	\$0.80
7	\$0.70	\$4.90	\$2.45	5	\$0.70	\$3.50	\$1.75
7	\$0.65	\$4.55	\$2.10	9	\$0.65	\$5.85	\$2.70
8	\$0.60	\$4.80	\$2.00	12	\$0.60	\$7.20	\$3.00
8	\$0.55	\$4.40	\$1.60	15	\$0.55	\$8.25	\$3.00
10	\$0.50	\$5.00	\$1.50	24	\$0.50	\$12.00	\$3.60