

DUE DATE: 11PM on Sunday, May 14, 2017

DIRECTIONS:

1. Answer each of the questions below and submit them before the due date. Late submissions and submitting by email will *not* be accepted.
2. The final draft of your answers should be composed on a word processor. (See the video “Creating your Problem Set Answers” for help on composing equations and graphs in Microsoft Word.)
3. Your answers should be presented in numerical order and saved as a single file in a pdf format. (The video, “Creating your Problem Set Answers,” shows you how to convert your Word.doc files into pdf documents.)
4. As noted in the Syllabus, copying the answers of a classmate or from an online source (or simply sharing answers with classmates) is grounds for receiving zero credit for the problem set and an automatic final grade of “F” in the class. If you work with a classmate, make sure that your answers are different and not exact copies.
5. Credit will be reduced for the following (see the “Rubric for Problem Sets”):
 - (a) Incorrect answers
 - (b) Illegible or disorganized answers
 - (c) Failure to show the derivation and calculation of your final answers
 - (d) Failure to compile your answers together into a single file or presenting them in order
6. A Discussion Board (“Questions about Problem Set 4”) has been provided on Blackboard for questions about the assignment. Office hours are available for questions about the assignment, as well.

Table 1: Total Costs for a Monopolist

Q	TC		Q	TC
0	800		21	6243.2
1	1131.2		22	6977.6
2	1409.6		23	7810.4
3	1642.4		24	8748.8
4	1836.8		25	9800
5	2000		26	10971.2
6	2139.2		27	12269.6
7	2261.6		28	13702.4
8	2374.4		29	15276.8
9	2484.8		30	17000
10	2600		31	18879.2
11	2727.2		32	20921.6
12	2873.6		33	23134.4
13	3046.4		34	25524.8
14	3252.8		35	28100
15	3500		36	30867.2
16	3795.2		37	33833.6
17	4145.6		38	37006.4
18	4558.4		39	40392.8
19	5040.8		40	44000
20	5600			

Question 1: (worth 40%)

A monopolist has its total costs (TC) of production given in Table 1. The (inverse) demand curve it faces in the market is described by this equation: $P = a - bQ = 2,000 - (28.75)Q$.

- 1(a). Derive the MC and ATC values using the equation $MC = \Delta TC / \Delta Q$ and $ATC = TC / Q$.
- 1(b). Draw the MC and ATC curves using the values derived for 1(a). Draw the inverse demand curve and its corresponding MR curve. Note: for the MR curve, be sure to use the equation learned in class, $MR = a - 2bQ$.
- 1(c). What is the price (P_M) and quantity (Q_M) that the monopolist will choose in order to maximize profit?
- 1(d). What is their total profit from the price and quantity combination in 1(c)?
- 1(e). What is the consumer surplus when they charge the price P_M from 1(c)?

Question 2: (worth 30%)

Assume that a competitive cell phone market has a demand curve described by the equation $P = 50 - (2.5)Q$ and a supply curve described by $P = 5 + (2)Q$.

- 2(a). What are the consumer and producer surpluses in this market?
- 2(b). What is the deadweight loss (DWL) if a price ceiling is set at $P_{max} = \$15$?
- 2(c). Does either the consumer or producer surplus increase with the price ceiling imposed in 2(b)? Be sure to show your calculations and reasoning.

Question 3: (worth 30%)

Two firms (RowGen and ColCom) are considering either releasing their new product line this month or next month (thus, they have two strategies “Now” and “Later”). Both firms benefit from releasing their product sooner than their competitor, but if they release at the same time, then they compete directly with each other and harm each other’s prominence on the market.

This strategic interaction is presented in normal-form in Table 2. The lower-left number in each cell represents the payoff to RowGen from its strategy, while the upper-right numbers represent the payoff to ColCom from its strategy. For example, if ColCom chooses “Later” and RowGen chooses “Now,” then ColCom receives 0 and RowGen receives 8.

Table 2: Normal-Form Game for Two Firms, RowGen and ColCom

		ColCom →	
		Now	Later
RowGen ↓	Now	2	0
	Later	8	4
		0	4

- 3(a). Does either of the firms have a dominant strategy? If so, what is it? Provide your reasoning.
- 3(b). What is the Nash Equilibrium of this game? Explain why it is the equilibrium of the game.
- 3(c). Is there an outcome that would be better (for both firms) than the Nash Equilibrium? Explain your answer.
