SMU
SINGAPORE MANAGEMENT UNIVERSITY

Economics & Society
Singapore Management University
School of Economics & O.C.C.
Kosmas Marinakis, Ph.D.
www.kmarinakis.org

Practice Set 3

Cost, Supply & Competitive Markets

This set contains problems for your own practice. It is highly recommended to work on the problems on your own. Do not just read the provided solutions. Instead, try to solve the problems and use the solutions only when you cannot continue on your own. Reading problems that someone else has solved has the same value for your preparation like watching someone else running a marathon on TV and then expecting to be able to run it, too. If you have questions on this set, please ask your section's teaching assistant.

1. Fill in the following table:

q	TC	VC	FC	MC
0	___	___	60	-
1	___	10	___	___
2	90	___	___	___
3	___	___	___	20
4	___	80	___	___
5	180	___	___	___
6	___	___	___	50

2. A print-shop produces books according to the production function $q = 200 \cdot L \cdot K$, where q is the number of copies of books produced per week, L denotes the number of typesetters (humans) and K denotes the number of printing presses (machines) used in production. The weekly salary of a typesetter is \$2. The weekly leasing cost of a press is \$4.
   (a) Find the number of books we can produce if we use 1 typesetter and 2 presses.
   (b) Find the number of books we can produce if we use 2 typesetters and 1 press.
   (c) Can we in general say that "*one can substitute 1 typesetter with 1 press while keeping production constant*"?
   (d) A publisher has ordered 2,000 copies of a book. How should the print-shop organize the production? Assume that L and K can only employed in whole units.

   Assume now that the print-shop leases 3 presses for 6 years.
   (e) How much is the FC for the company per week?
   (f) Derive the total cost function for the production of books per week.

3. A firm's total cost function is given by $TC = 20 + 0.5q + 0.05q^2$.
   (a) Calculate the FC and the VC.
   (b) Calculate the AC, the AFC and the AVC.
   (c) For the above TC, the marginal cost is given by $MC = 0.5 + 0.1q$. Find at which quantity AC is minimum.

4. Klara used to be a tutor of Spanish and she was charging 30 euros per hour for lessons. Recently, she started an online store where she sells handmade necklaces. The market for necklaces is perfectly competitive and the price for a necklace is 20 euros. The cost of materials for a necklace starts at 6 euros for the first necklace and keeps increasing by 1 euro per for each next necklace because it becomes harder and harder to find the raw materials in one day. Once she has the materials, it takes Klara 10 minutes to make a necklace.
   (a) Write down Klara's marginal cost equation and use it to derive the optimal number of necklaces she should produce per day.
   (b) Derive how many necklaces Klara should produce per day by using a table with Klara's MC.

(c) How much is the total *economic profit* for Klara's enterprise?

(d) How much is the *total accounting profit* for Klara?

(e) How much is the *economic profit* that Klara makes from the last necklace she supplies per day?

(f) What will be the effect on the economic profit of Klara's enterprise if she produced one necklace above the optimal number of necklaces?

5. *"The PC firm of figure 1 produces quantity q^*. However, if the firm produced at q' it would minimize its cost per unit, and thus, it would achieve a higher profit."* True or false?

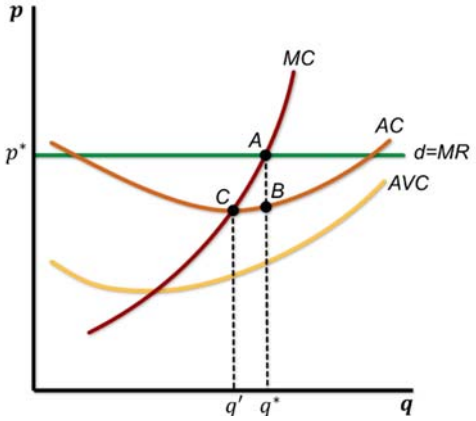

Figure 1

6. Explain why a PC firm will not shut down in the S-R when $AVC < p < AC$.

7. Which of the following formulas would yield the profit of a firm?
   (1) $\Pi = R - C$, (2) $\Pi = (p - AC)q$, (3) $\Pi = (p - AVC)q - FC$.

8. Explain why when MC is constant, then $AVC = MC$.