

1) Complete the following table.

Output	Fixed Cost	Total Cost	Average Cost	Marginal Cost	Variable Cost	AVC
0	12	12	NA	NA	NA	X
1	12	23	23	11	11	11
2	12	33	16.5	10	21	10.5
3	12	44	14.67	11	32	10.67
4	12	56	14	12	44	11
5	12	69	13.8	13	57	11.4
6	12	84	14	15	72	12
7	12	101	14.4	17	89	12.7
8	12	121	15.1	20	109	13.6

a) Is this a short run or long run information on cost? Why?

Short run because there are fixed costs.

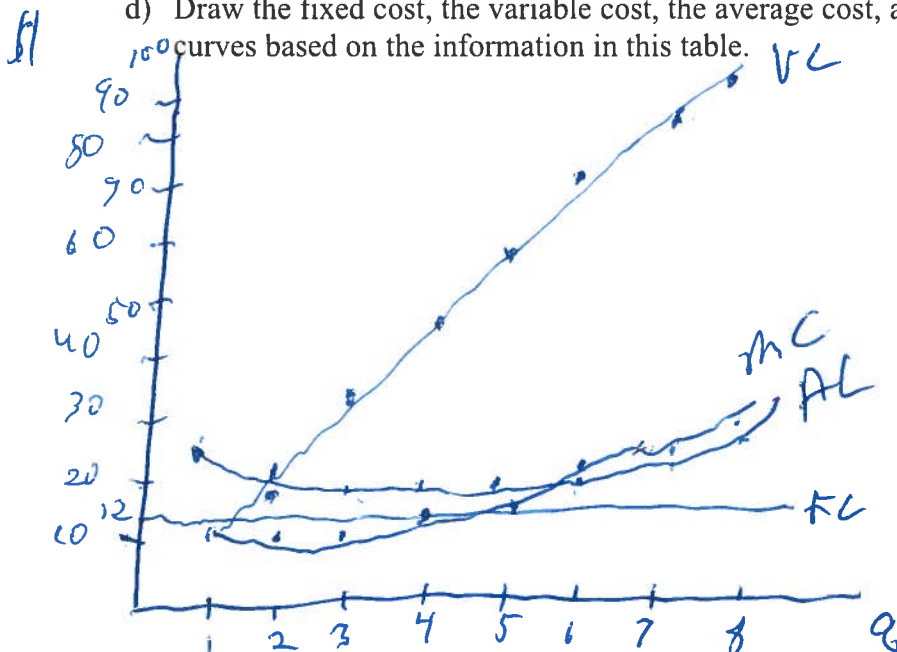
b) If the price of the good produced is currently 13, what level of output is the profit maximizing level?

① $P = MC(q), 13 = MC(q=5), q=5$
 ② $P = 13 > AVC(q=5) = 11.4$ or $\pi(q=5) = 13 \cdot 5 - 69 = -4$
 $\pi(q=0) = 0 - 12 = -12$

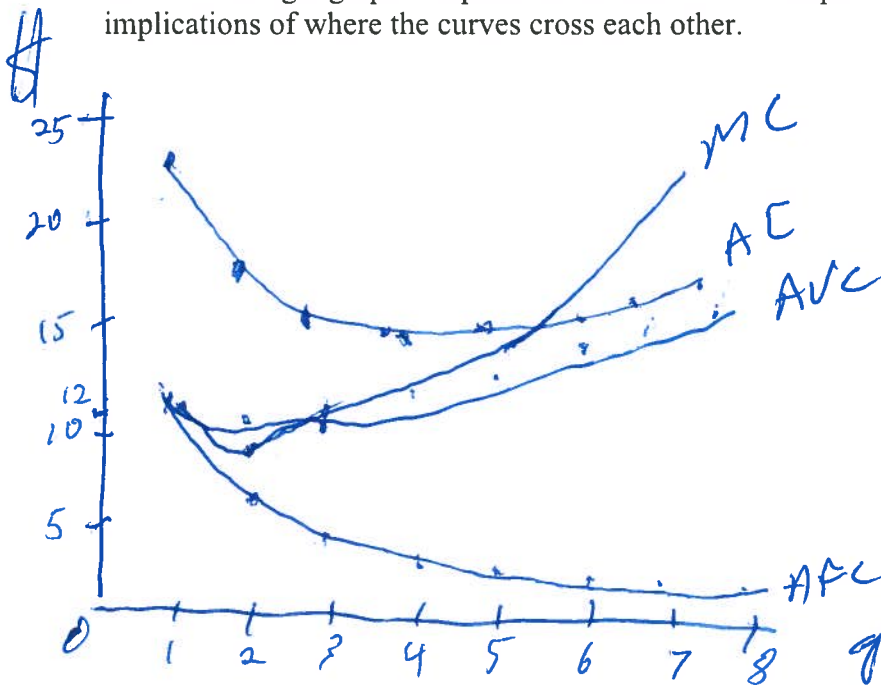
c) Should the firm produce at this level, or should it shut down? Why?

It is better off producing 5 and getting -4 than shutting down and earning -12

d) Draw the fixed cost, the variable cost, the average cost, and the marginal cost curves based on the information in this table.



- 2) Using the information in the table in problem one, draw an average variable cost curve, an average fixed cost curve, an average cost curve and a marginal cost curve on a single graph. Explain the reasons for the shape of each, and the implications of where the curves cross each other.



MC crosses AVC from below at minimum of AVC.
 MC crosses AC from below at the minimum of AC.
 when MC is below AC/AVC, AC/AVC decrease as Q increases.
 when MC is above AC/AVC, AC/AVC increase as Q increases.

- 3) Define the seven short run cost concepts.

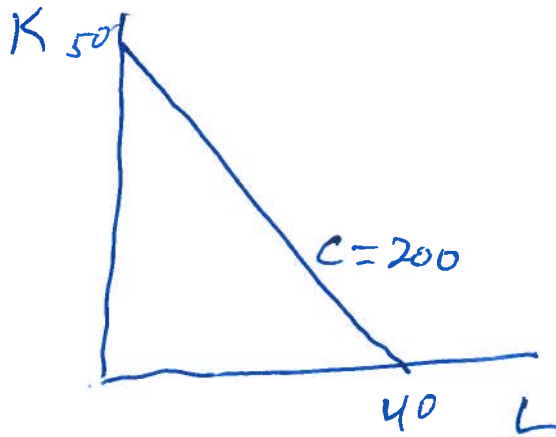
FC - the costs of inputs that do not change as output increases
 VC - the costs of inputs that do change as output increases
 $TC = FC + VC$
 $AC = \frac{TC}{Q}$
 $AFC = \frac{FC}{Q}$
 $AVC = \frac{VC}{Q}$
 $MC = \frac{\Delta TC}{\Delta Q} = \frac{\Delta VC}{\Delta Q}$

Which of these are applicable in the long run? Why?

AC
 TC
 MC.

All the other short run cost concepts are based on a distinction between fixed and variable cost. In the long run all costs are

- 4) Assume the rental rate of capital is 4, and the wage rate is 5.
a. Draw an isocost curve for a cost level of 200.



$$\begin{aligned} r &= 4 \\ w &= 5 \\ C &= \$200 \end{aligned}$$

- b. What should the marginal rate of technical substitution be at an economically efficient bundle?

$$MRTS = \frac{-w}{r} = \frac{-5}{4}$$

- c. What is the slope of the isocost curve you drew in part a at the economically efficient bundle?

Slope of the isocost at the economically efficient bundle is $-5/4$

- 5) My variable cost of producing rakes is \$5,000 per day, and the fixed costs of running my rake factory are \$120,000 per 30 day month (we work every day). Below what level of revenue would I be better off shutting down and not producing any rakes?

Below \$5000 when you would not have enough revenue to cover variable costs

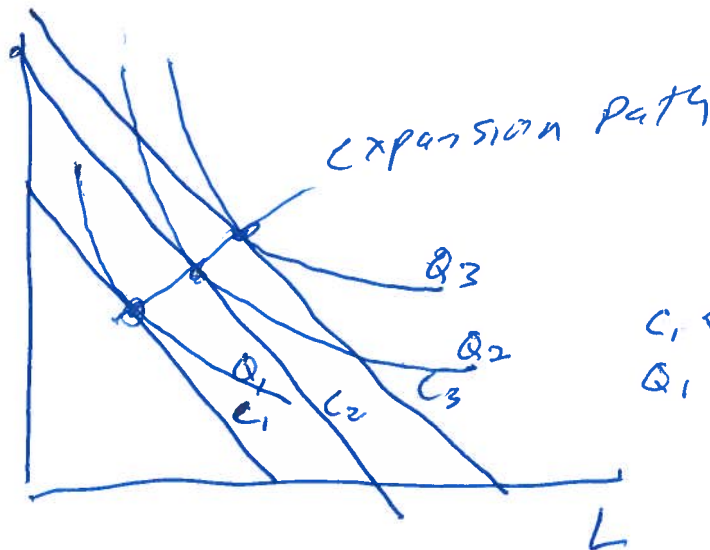
- 6) Describe the expansion path.

- a. Define the expansion path.

The line tracing out cost minimizing ways of producing output - the points of tangency of isocosts and isoquants

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- b. Illustrate on a graph how the expansion path is derived.



$C_1 < C_2 < C_3$
 $Q_1 < Q_2 < Q_3$

- c. Are there points on the expansion path that are technically efficient but are not economically efficient? Why or why not?

No, all points on the expansion path are both technically efficient (on an isoquant) and economically efficient (at point of tangency of the isocost to the isoquant)

- d. Can we identify a profit maximization point based on the information contained in the expansion path? Why or why not?

No we can not. We don't know the ~~price~~ selling price of the good (q) we are making