Introduction to Microeconomics (HM207)
Tutorial 7: Production Theory

1. What is the relationship between a firm's total revenue, profit, and total cost?
2. Give an example of an opportunity cost that an accountant might not count as a cost. Why would the accountant ignore this cost?
3. What is marginal product, and what does it mean if it is diminishing?

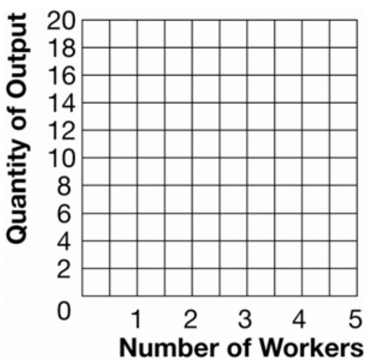
4. There are many types of costs: opportunity cost, total cost, fixed cost, variable cost, average total cost, and marginal cost. Fill in the type of cost that best completes the phrases below:
   a. The true cost of taking some action is its _______.
   b. _______ is falling when marginal cost is below it, and rising when marginal cost is above it.
   c. A cost that does not depend on the quantity produced is a _______.
   d. In the ice-cream industry in the short run, _______ includes the cost of cream and sugar, but not the cost of the factory.
   e. Profits equal total revenue less _______.
   f. The cost of producing an extra unit of output is _______.

5. Joe runs a small boat factory. He can make ten boats per year and sell them for €25,000 each. It costs Joe €150,000 for the raw materials (fibreglass, wood, paint, and so on) to build the ten boats. Joe has invested €400,000 in the factory and equipment needed to produce the boats: €200,000 from his own savings and €200,000 borrowed at 10 percent interest. (Assume that Joe could have loaned his money out at 10 percent, too.) Joe can work at a competing boat factory for €70,000 per year.
   a. What is the total revenue Joe can earn in a year?
   b. What are the explicit costs Joe incurs while producing ten boats?
   c. What are the total opportunity costs of producing ten boats (explicit and implicit)?
   d. What is the value of Joe's accounting profit?
   e. What is the value of Joe's economic profit?
   f. Is it truly profitable for Joe to operate his boat factory? Explain.

6. The following table describes the production and cost of hamburgers at a roadside stand. All figures are measured per hour.

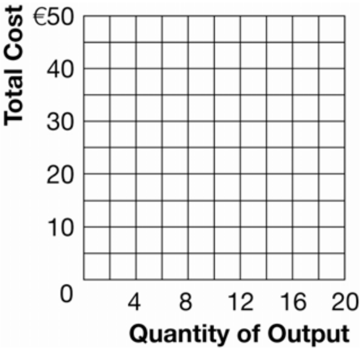
Number of Workers	Output	Marginal Product of Labour	Cost of Factory	Cost of Workers	Total Cost
0	0		€25	€0	_______
		_______			
1	6		25	5	_______
		_______			
2	11		25	10	_______
		_______			
3	15		25	15	_______
		_______			
4	18		25	20	_______
		_______			
5	20		25	25	_______

   a. Complete the table and plot the production function below.



b. What happens to the marginal product of labour as more workers are added to the production facility? Why? Use this information about the marginal product of labour to explain the slope of the production function you plotted above.

c. Plot the total-cost curve below.

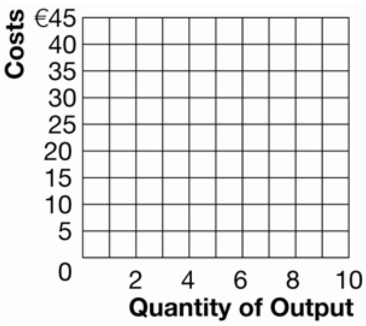


d. Explain the shape of the total cost curve.

7. The information below is for Bob's blue jeans manufacturing plant. All data is per hour. Complete the table. Note the following abbreviations: FC (fixed cost), VC (variable cost), TC (total cost), AFC (average fixed cost), AVC (average variable cost), ATC (average total cost), MC (marginal cost).

Quantity	*FC*	*VC*	*TC*	*AFC*	*AVC*	*ATC*	*MC*
0	€16	€0					
1	16	18					
2	16	31					
3	16	41					
4	16	49					
5	16	59					
6	16	72					
7	16	90					
8	16	114					
9	16	145					
10	16	184					

a. Complete the table and plot AFC, AVC, ATC, and MC below.



b. Explain the shape of each of the curves you plotted in part (a) above.

c. Explain the relationship between ATC and MC.

d. Explain the relationship between ATC, AFC, and AVC.

e. What is Bob's efficient scale? How do you find the efficient scale? Explain.