

Consider the (partial) cost information for a firm printed below.

Output (Q)	Total Cost (TC)	Fixed Cost (FC)	Variable Cost (VC)	Average Variable Cost (AVC)	Average Fixed Cost (AFC)	Average Total Cost (ATC)	Marginal Cost (MC)
3	160	100	60	30	33.33	53.33	-
4	172	100	72	18	25	43	12
5	185	100	85	17	20	37	13
6	210	100	110	18.33	16.67	35	25
7	240	100	140	20	14.29	34.29	30
8	280	100	180	22.50	12.50	35.00	40
9	330	100	230	25.56	11.11	36.67	50
10	390	100	290	29	10	39.00	60.00

(a) Fill in the missing values in the table. (For marginal cost, put the marginal cost on the lower line rather than in between. For example, the marginal cost between $Q=9$ and $Q=10$ is 60 but is written on the $Q=10$ line.)

(b) Suppose the firm sells its output in a perfectly competitive market at a price of \$40 per unit. How much should it produce and what will its profits be?

In a perfectly competitive market, the firm should produce the output where $P = MC$: a quantity of 8. Profits are revenues minus costs. Its revenues would be $P \times Q = 8 \times 40 = 320$. Its costs would be 280. So, its profits would be \$40.

(c) Suppose the price the firm receives is only \$15. Should it produce anything at all? Explain.

At a price of \$15 it should not produce anything at all. When price is less than AVC the firm will have higher profits shutting down than if it produces. ($P = AVC$ is called the "shut-down point.") If it did produce at $P=15$, it would earn a maximum profit at $Q=5$. At this point, its profits would be -110 (revenues=75, costs=185). If it shut down, it would have profits of -100 (fixed costs).