Intermediate Microeconomics

PROFIT MAXIMIZATION

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Outline of objectives

1. Define the objective of the firm: profit maximization.

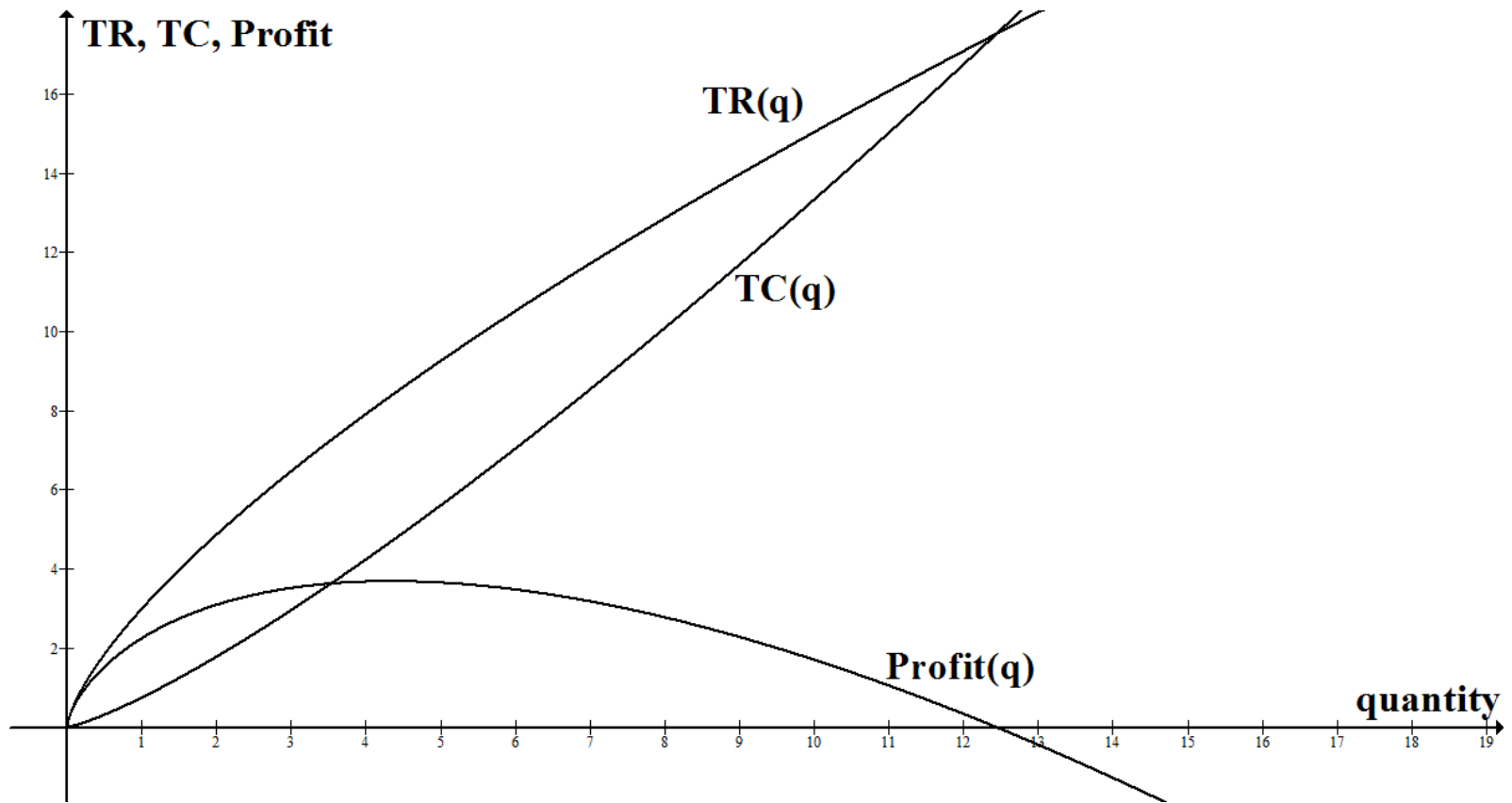2. Apply simple differential calculus, to solve the profit maximization problem.

Profit

$$Profit \equiv \Pi = TR - TC$$

Marginal Revenue: (MR) The extra revenue a firm receives when it sells one more unit of output.

TC, TR, Π (graphically)

MR = MC

$$\frac{\partial \Pi}{\partial q} = \frac{\partial TR}{\partial q} - \frac{\partial TC}{\partial q} = MR - MC.$$

$$MR - MC = 0 \rightarrow MR = MC.$$

Example

$$TR = 9q \text{ and } TC = 3q^2.$$

Intuition

Optimal q: $9 - 6q = 0 \rightarrow q^* = \dfrac{9}{6} = 1.5$ units.

Profit level

$$\Pi(q^*) = 9(1.5) - 3(1.5)^2 = \$6.75.$$

Summary

The firm's objective is to maximize profits.

Profit is defined as Revenue minus Cost.

Profit is maximized when the firm chooses an output level at which marginal revenue equals marginal cost.

Conclusion

We have answered the question of how the firm maximizes profit for a general case.

Next we explore the results when firms sell their output in a goods market.

This creates the firm's revenue, so the price that the output fetches in the market is of crucial importance.

You will see that the relationship between output and its price varies across markets, so we will examine several important features of output markets in the next lesson.