

Calculus for Economics & Business: Notation & Definitions

- p = price (per unit quantity).
 q = quantity (per unit time period) demanded or produced.
- C or TC = total cost (of production and marketing, per unit time).
 MC = marginal cost = $\frac{dC}{dq}$.
 TFC = total fixed cost (or overhead) = cost when $q = 0$.
 TVC = total variable cost.
 $TC = TFC + TVC$.
 AFC or AC = average cost (per unit output) = C/q .
 AFC = average fixed cost = TFC/q .
 AVC = average variable cost = TVC/q .
- R or TR = total revenue (per unit time) = pq = (price per unit) · (# of units sold per unit time).
 MR = marginal revenue = $\frac{dR}{dq}$.
 $MR = p + q \frac{dp}{dq} = p(1 + 1/\eta)$.
 AR = average revenue (per unit of output) = $R/q = pq/q = p$.
- Π = profit = $R - C = pq - C$.
 $M\Pi$ = marginal profit = $\frac{d\Pi}{dq} = MR - MC$.
- η = elasticity = $\lim_{\Delta p \rightarrow 0} \frac{\Delta q/q}{\Delta p/p} = \frac{p}{q} \frac{dq}{dp} = \left(\frac{p}{q}\right) / \left(\frac{dp}{dq}\right)$.
- Profit maximizing behavior: A firm maximizes profit by increasing output q as long as $MR > MC$ until an output level where $MR = MC$ is reached, and increasing output no further (so as to avoid having $MR < MC$), provided that $AR \geq AVC$ ($p \geq AVC$) so that it is worthwhile to produce more than 0 in the first place.