

## 8.4 Summary

Suppose you produce and sell Things. The following table summarizes the terms we've learned so far relating to revenue and cost. Assume you are given a graph of total cost  $TC(q)$  and total revenue  $TR(q)$  for producing and selling  $q$  Things.

Term	Definition	Related equations and formulas	Graphical Interpretation
total cost $TC(q)$	the total amount you spend to produce $q$ Things	$TC(q) = VC(q) + FC$	—
variable cost $VC(q)$	the money you spend to produce $q$ Things without including fixed costs	$VC(q) = TC(q) - FC$	the graph of $VC$ has the same shape as $TC$ and goes through the origin
fixed cost $FC$	the money you must spend even if you produce 0 Things; also known as <i>overhead</i>	$FC = TC(q) - VC(q)$ $FC = TC(0)$	the vertical distance between the $TC$ and $VC$ graphs OR the “ $y$ ”-intercept of the $TC$ graph
average cost $AC(q)$	total cost averaged over the number of Things produced	$AC(q) = \frac{TC(q)}{q}$	the slope of the diagonal line through the $TC$ graph at $q$
average variable cost $AVC(q)$	variable cost averaged over the number of Things produced	$AVC(q) = \frac{VC(q)}{q}$	the slope of the diagonal line through the $VC$ graph at $q$
breakeven price BEP	the smallest value of average cost	—	the slope of the least steep diagonal line that intersects the $TC$ graph
shutdown price SDP	the smallest value of average variable cost	—	the slope of the least steep diagonal line that intersects the $VC$ graph
marginal cost $MC(q)$ (see footnote)	the incremental rate of change in $TC$ from $q$ to $q + 1$ Things	$MC(q) = \frac{TC(q+1) - TC(q)}{1}$	the slope of the secant line through $TC$ (or $VC$ ) at $q$ and $q + 1$
total revenue $TR(q)$	the total amount you receive when you sell $q$ Things	—	—
average revenue $AR(q)$	total revenue averaged over the number of Things sold; also known as <i>price per Thing</i>	$AR(q) = \frac{TR(q)}{q}$	the slope of the diagonal line through the $TR$ graph at $q$
marginal revenue $MR(q)$ (see footnote)	the incremental rate of change in $TR$ from $q$ to $q + 1$ Things	$MR(q) = \frac{TR(q+1) - TR(q)}{1}$	the slope of the secant line through the $TR$ graph at $q$ and $q + 1$
profit $P(q)$	the money you are left with after subtracting total cost from total revenue	$P(q) = TR(q) - TC(q)$	the vertical distance between $TR$ and $TC$ (when $TR > TC$ )

NOTE: If  $q$  is measured in hundreds or thousands of Things, the definitions, formulas, and graphical interpretations of marginal revenue and marginal cost must be adjusted appropriately.