

Applications (MR \rightarrow TR)

Aim

To demonstrate an application of integration.

Learning Outcomes

At the end of this section you will be able to:

- Identify a practical application of integration,
- Calculate the total revenue(TR) function from the marginal revenue(MR) function.

Marginal revenue is an important concept in basic microeconomics. Marginal revenue(MR) is the extra revenue that an additional unit of product will bring a firm. It can also be described as the change in total revenue/change in number of units sold.

Therefore, $MR = \frac{d}{dQ}(TR)$. From this we can conclude that

$$\int MR dQ = TR$$

The very same relationship exists between the marginal cost(MC) and the total cost(TC) functions for the product, $\int MC dQ = TC$.

Example

If a marginal revenue function is given as $MR = 10Q^2 + 6Q - 3$, find an expression for the total revenue function(TR).

We know

$$\int MR dQ = TR$$

therefore

$$\int (10Q^2 + 6Q - 3)dQ = 10\frac{Q^3}{3} + 6\frac{Q^2}{2} - 3Q = \frac{10}{3}Q^3 + 3Q^2 - 3Q + C$$

Related Reading

Jacques, I. 1999. *Mathematics for Economics and Business*. 3rd Edition. Prentice Hall.