Roll: 1605029

Question: What is the relationship between average cost and average product? Also, what is the relationship between marginal cost and marginal product? Show graphically.

Answer: We know,

$AC = TC / Q$ ——— (i)

$AP = Q / N$

$\Rightarrow N/Q = 1/AP$ ——— (ii)

$TVC = N P_c$ ——— (iii)

Here,
AC = Average cost
AP = Average product
TC = Total cost
Q = Total product / Quantity / Output
N = Number of units of variable input
TVC = Total variable cost
P_c = Price per unit

In the long run,

$AC = AVC$

$= TVC / Q$

$= N P_c / Q$ [Using (iii)]

$= P_c / AP$ [Using (ii)]

Here,
AVC = Average variable cost

Now,

$$MC = \frac{d(TVC)}{dQ}$$

$$= \frac{d(N P_c)}{dQ}$$ [Using (iii)]

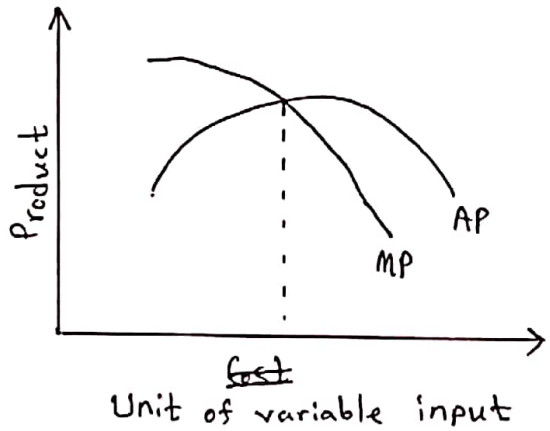
$= P_c \frac{dN}{dQ}$

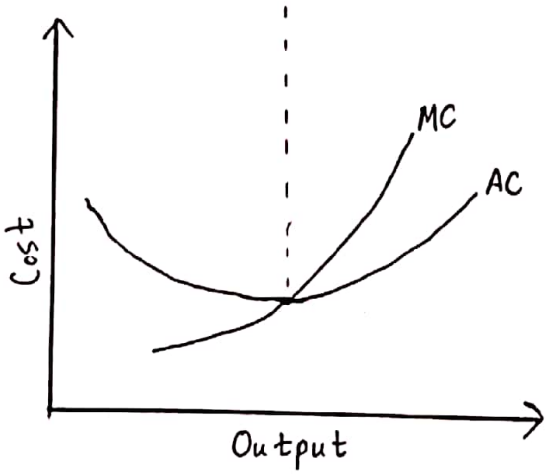
$= \frac{P_c}{\frac{dQ}{dN}}$

$= \frac{P_c}{MP}$ [Using (ii)]

Here,
Mc = Marginal Cost
MP = Marginal Product

Therefore we can conclude that cost and product are inversely proportional to each other.





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