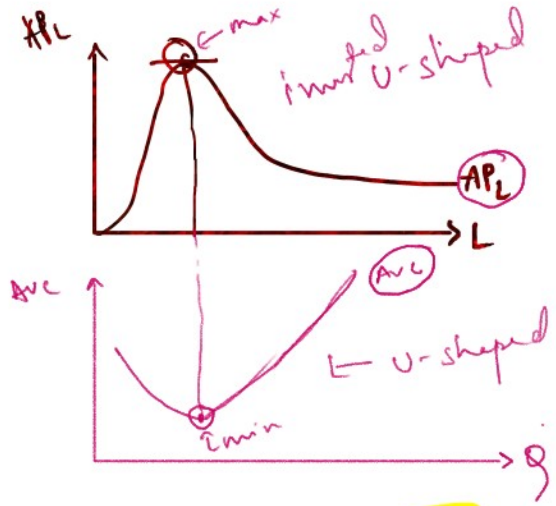
08 August 2023 10:14 PM

① Relation between AP_L and AVC

AP_L ↓ Average product of Labour

AVC ↓ Average variable cost



↳ AVC is reciprocal / mirror image of AP_L.

That is

① if AP_L is increasing
↳ AVC is decreasing.

② If AP_L is at max
↳ AVC is at minimum.

③ If AP_L is falling
↳ AVC is increasing

In short run, let Labour be the only factor of production. TVC is cost of Labour

if L labour and w is wage then $TVC = wL$

$$AP_L = \frac{Q}{L}$$

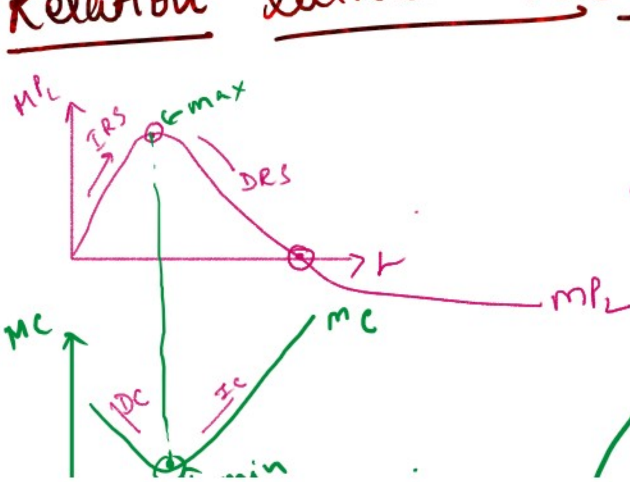
$$AVC = \frac{TVC}{Q} = \frac{w \cdot L}{Q} = \frac{w}{Q/L}$$

$$\therefore AVC = \frac{w}{AP_L}$$

w is const $\therefore AVC \propto \frac{1}{AP_L}$

∴ AVC is inversely related to AP_L.

Relation between MP_L and MC :



MP_L and MC are reflection / mirror image of each other.

$MP_L = \frac{\Delta Q}{\Delta L}$ ie $\frac{\text{change in } Q}{\text{change in } L}$

$TC = TVC + TFC$

In short run ⇒ L is variable factor

ie, As MP_L ↑ses ⇒ MC decreases

As MP_L max ⇒ MC at min

As MP_L is falling ⇒ MC is increasing.

In short run ⇒ L is variable factor

$\therefore TVC = w \cdot L$

ie $TC = w \cdot L + TFC$

$$\frac{\Delta TC}{\Delta Q} = w \frac{\Delta L}{\Delta Q} + 0$$

$$MC = \frac{w}{\Delta Q / \Delta L} = \frac{w}{MP_L}$$

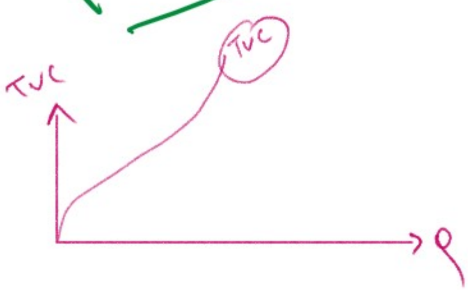
$$MC \propto \frac{1}{MP_L}$$

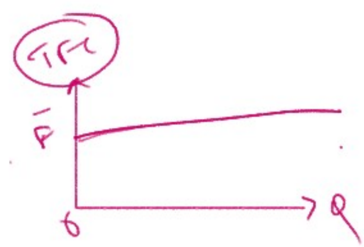
MC is inversely related to MP_L.

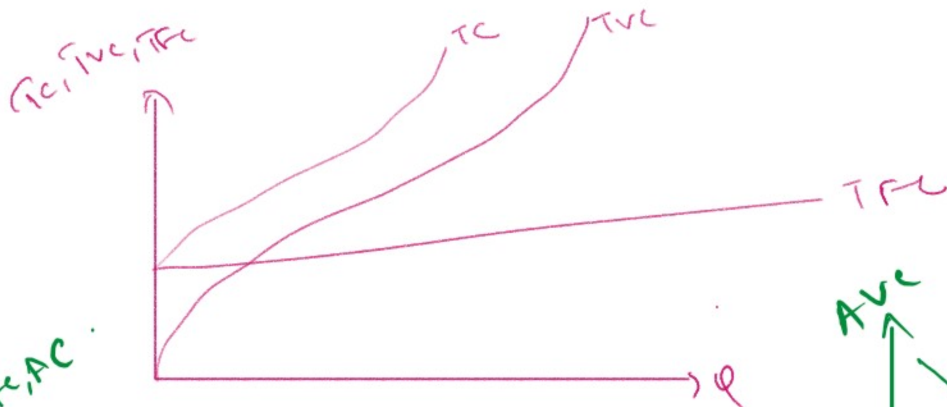
Formulas of cost curves in short run

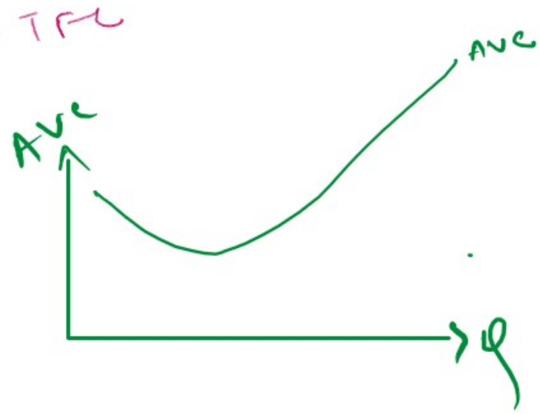
1. $TC = TVC + TFC$
2. $AC = \frac{TC}{q} = \frac{TVC}{q} + \frac{TFC}{q}$

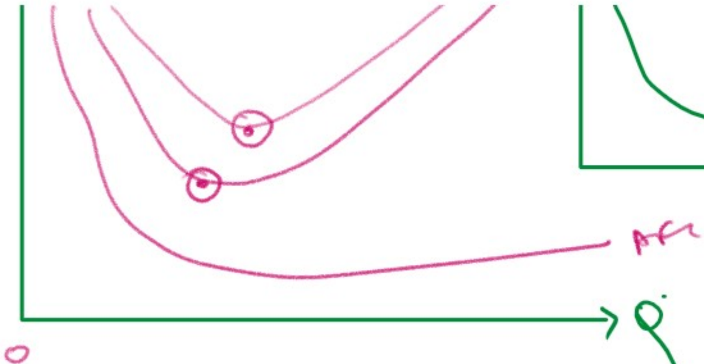
   $AVC + AFC = AC$.
3. $MC = \frac{\Delta TC}{\Delta Q} = \frac{\Delta TVC}{\Delta Q}$.

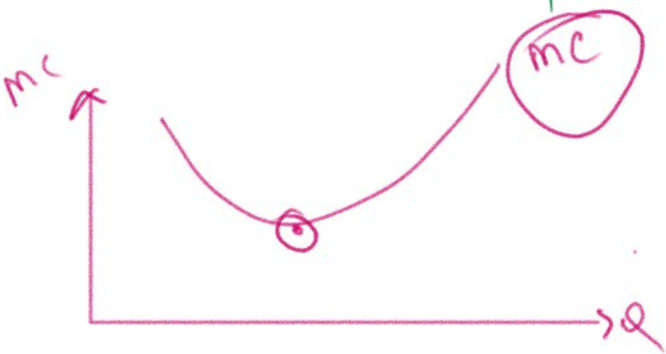


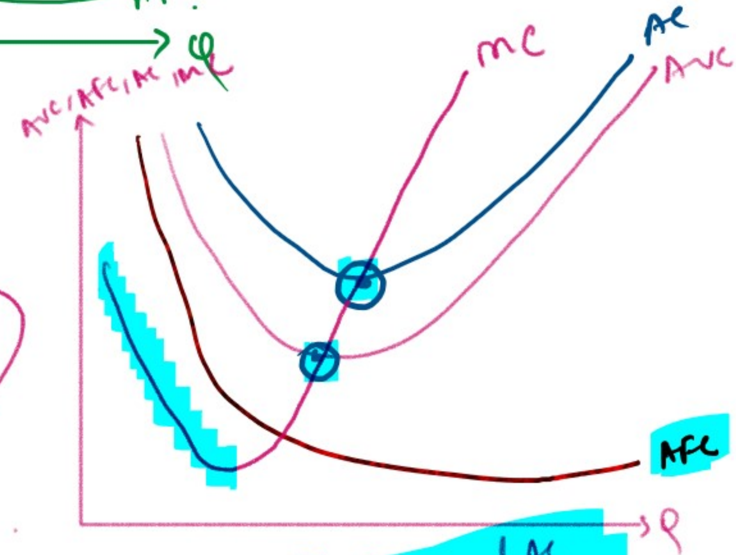












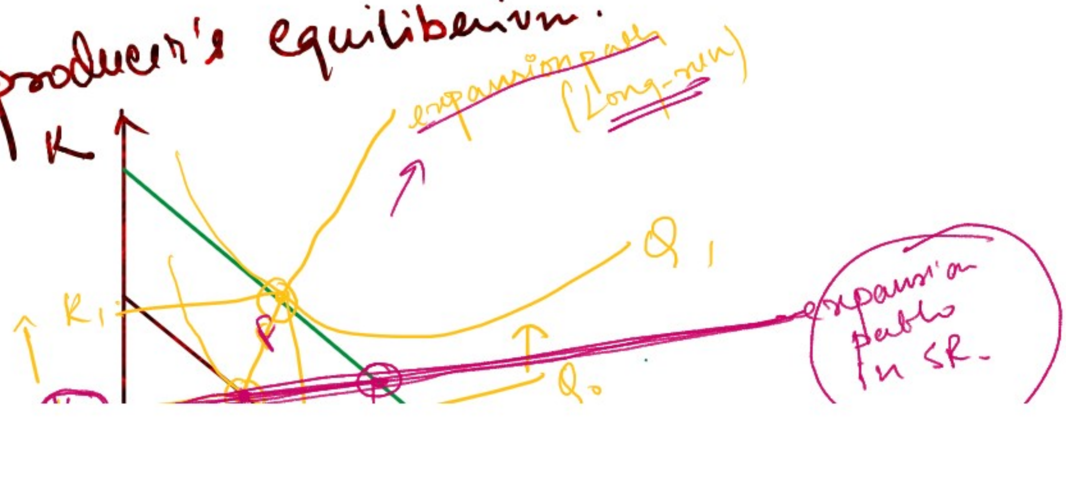
MC cuts AVC and AC at it's minimum point

Expansion Path in Short-run and Long-run

Expansion → expanding the output.

Short-run → only L ↑ing, K is fixed

Concept of producer's equilibrium.



① In short run, expansion path is horizontal (because K is fixed only Labour increases).

② In long-run expansion path is upward sloping straight line passing through origin.

Q For an output 'q' upto 600 tons per day, total variable cost is \$1140 q. So Average variable cost & Marginal cost are constant at \$1140 per ton. If we increase production beyond 600 tons, the marginal cost of Labour, maintenance, and freight increases from \$320 ton to \$480 per ton, which causes MC as a whole to increase from \$1140 per ton to \$1300 ton. What happens to average variable cost when output is greater than 600 tons per day?

when $q = 60$, $TVC = 1140q = 1140 \times 60 = 68400$

$AVC = \frac{TVC}{q} = \frac{1140\cancel{q}}{\cancel{q}} = 1140$

(output increases by more than 600)

$MC = \frac{\Delta TVC}{\Delta q} = 1140$

say $q > 600$

If $q > 600$

If $q > 600$ say $q' > 600$ Δq

change in output $\Delta q = q' - 600$

$MC = 1300$

$\therefore$ Total variable cost $TVC = (1140q) + 1300(q' - 600)$

$TVC = (1140 \times 600) + 1300(q' - 600)$

$TVC = 684000 + 1300q' - 780000$

$\boxed{TVC = 1300q' - 96{,}000}$

$\therefore AVC = \frac{TVC}{q'} = \frac{1300q' - 96000}{q'}$

Ans: $\boxed{AVC = 1300 - \frac{96000}{q'}}$