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Exam : Microeconomic

Answer 1: $f = \sqrt[3]{ws} \Rightarrow f = w^{1/3} s^{1/3}$

$P_w = 30 \quad P_s = 6$

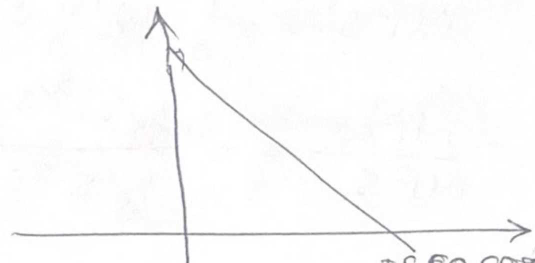
a) Iso cost is set of combination of two variable or inputs to have the same level of out put

$TC = wP_w + sP_s \quad TC = 30w + 6s$

$6s = TC - 30w \Rightarrow s = \frac{TC}{6} - \frac{30}{6}w$

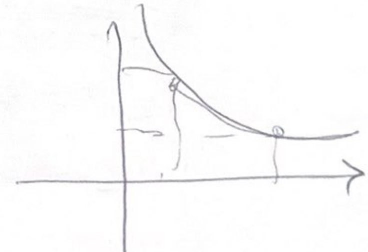
$s = \frac{TC}{6} - 5w$

the slop is Negative



Iso cost

b: Isoquat set is the combination of ~~labor~~ or two variables to have the same level of input.



$F = w^{1/3} . s^{1/3}$

$w^{1/3} = \frac{f}{s^{1/3}} \quad / \, 3$

$(w^{1/3})^3 = \left(\frac{f}{s^{1/3}}\right)^3 \Rightarrow \boxed{w = \frac{F^3}{s}}$

c) for obtaining the total cost function we need to have the tangecy condition

$\Rightarrow MRTS = -\frac{P_W}{P_S}$ $\quad$ s.t. $f = w^{1/3}s^{1/3}$

$TC = P_W W + P_S S$

$MRTS = -\frac{MPW}{MPS}$

$MPW = \frac{1}{3} w^{1/3-1} s^{1/3} = \frac{1}{3} w^{-2/3} s^{1/3}$

$MPS = \frac{1}{3} w^{1/3} s^{-2/3}$

$-\frac{MPW}{MPS} = -\frac{\cancel{1/3}\, w^{-2/3}.s^{1/3}}{\cancel{1/3}\, s^{-2/3}.\, w^{1/3}} = \frac{s^{1/3}.\, s^{2/3}}{w^{1/3} w^{2/3}} = -\frac{s}{w}$

$\Rightarrow -\frac{s}{w} = -\frac{30}{6} \Rightarrow \frac{s}{w} = 5 \Rightarrow \boxed{S = 5W}$

$\cancel{TC = 30W + 6S}$

$\cancel{TC = 30W + 6.5W} =$

$\boxed{\cancel{TC = 60W}}$

$\Rightarrow f = w^{1/3}.s^{1/3}$

$F = w^{1/3}.(5w)^{1/3}$

$F = w^{1/3}.5w^{1/3}$

$F = w^{\frac{2}{3}}.5^{1/3}$

$w^{\frac{2}{3}} = \frac{f}{5^{1/3}} \quad /\wedge \frac{3}{2} \Rightarrow W^D = \frac{f^{3/2}}{5^{1/2}} \Rightarrow$

$WP = f^{3/2}.5^{-1/2}$

③

$$\boxed{w^D = f^{3/2} \cdot s^{-1/2}}$$

$$S = s \cdot (f^{3/2} \cdot s^{-1/2})$$

$$TC = 30 \cdot f^{3/2} s^{-1/2} + 6 \cdot 5 f^{3/2} \cdot s^{-1/2}$$

$$TC = 6 \cdot 5 \; f^{3/2} s^{-1/2} + 6 \cdot 5 \; f^{3/2} \cdot s^{-1/2}$$

$$TC = \frac{6 \cdot \sqrt{5} \cancel{\sqrt{s}} \; f^{3/2}}{\cancel{\sqrt{s}}} + \frac{6 \cdot \sqrt{5} \cancel{\sqrt{s}} \; f^{3/2}}{\cancel{\sqrt{s}}}$$

$$TC = 6 \sqrt{5} \; f^{3/2} + 6 \cdot \sqrt{5} \; f^{3/2}$$

$$TC = 6 \sqrt{5} \sqrt{f^3} + 6 \cdot \sqrt{5} \; \sqrt{f^3}$$

$$TC = 13,8 \sqrt{f^3} + 13,8 \sqrt{f^3} = 26,76 \cdot \sqrt{f^3}$$

D) inverserse ~~dem di~~ and direct ~~dem~~ supply function.

$$\pi = \cancel{P} \, \pi(R) Q - TC(Q)$$

$$\pi = P \cdot Q - TC(Q)$$

$$\cancel{\pi = 3240 \cdot Q -}$$

$$\pi = P \cdot Q - 26,76 \sqrt{f^3}$$

f) = AC = ? MC = ?

$$\frac{TC}{f} = \frac{26,76 \sqrt{f^3}}{f} = \cancel{26,76}$$

$$= \frac{26,76 \cdot \sqrt{f^2 \cdot f}}{f} = \cancel{26,76 f} =$$

$$\frac{\partial TC}{\partial f}$$

$$AC = \frac{26,76\, \cancel{f} \cdot \sqrt{F}}{\cancel{f}}$$

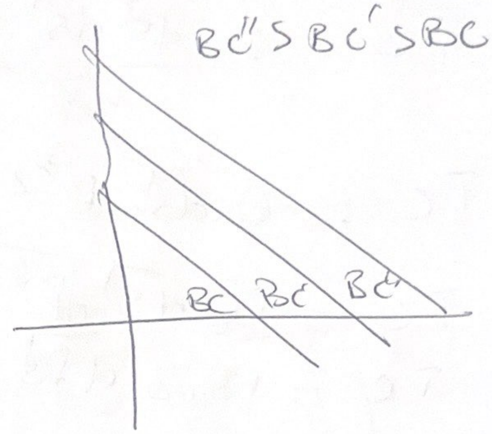
$$AC = 26,76\sqrt{F}$$

$$MC = 26,76 \cdot \frac{3}{2} \cdot f^{3/2-1}$$

$$MC = 40,14\, \cancel{\$} f^{1/2} \Rightarrow 40,14\sqrt{f}$$

Answer No2,

$$U = x^{\frac{2}{3}} y^{1/3}$$



a) $I = P_x x + P_y y$

$$y = \frac{I}{P_y} - \frac{P_x}{P_y} x$$

$$MRS = -\frac{y}{x}$$

$$-\frac{y}{x} = -\frac{20}{6} \Rightarrow -\frac{y}{x} = -\frac{10}{3}$$

$$\boxed{y_0^* = \frac{10}{3} x}$$

$$180 = 20x + 6y$$

$$180 = 20x + \frac{10}{\cancel{3}} \cancel{6}^{2} y \Rightarrow 180 = 20x + 20x$$

$$180 = 40x \Rightarrow x = \frac{\cancel{180}^{4,5}}{\cancel{40}_{1}} \Rightarrow \boxed{x_0^* = 4,5}$$

$$U_0 = (4,5)^{2/3} \cdot \cancel{\$} \left(\frac{10}{3}\right)^{1/3}$$

b) $U = x^{\frac{2}{3}} y^{\frac{1}{3}}$

$y^{1/3} = \frac{U}{x^{2/3}} = y = \frac{U^{3}}{x^2} = \frac{U^3}{x^2}$

$MRS = -\frac{y}{x}$

$-\frac{y}{x} = -\frac{\overset{4,6}{28}}{\underset{1}{\cancel{6}}} \Rightarrow \frac{y}{x} = +4,6 \Rightarrow \frac{y}{x} = \frac{14}{3}$

$\boxed{y = 4,6x}$

$180 = 28x + 6y \Rightarrow 180 = 28x + \frac{14}{\cancel{3}} x \cdot \overset{2}{\cancel{6}}$

$180 = 28x + 28x \Rightarrow 180 = 56x$

$\boxed{x = \frac{180}{56}}$ $\boxed{x_1^* = 3,2}$

$\boxed{y^* = 14,72}$

c) optimal bundle

$$\begin{cases} MRS = -\frac{P_x}{P_y} \\ I = P_x y + P_y (y) \end{cases}$$

$MRS = -\frac{y}{x}$

$+\frac{y}{x} = \frac{20}{6} = \boxed{y = \frac{20}{6} x}$

$x_1^* =$

$180 = 20x + 6y$

$180 = 20x + \cancel{6} \cdot \frac{20}{\cancel{6}} x$

$180 = 20x + 20x$

$180 = 40x$

$\boxed{x = \frac{\overset{4,5}{\cancel{180}}}{\cancel{40}}}$

$\boxed{x = 4,5}$

D :- $P'(x) = 28$

$MRS = -\frac{P'(x)}{py}$

$-\frac{y}{x} = -\frac{28}{6} \Rightarrow y = \frac{28}{6}x$

$180 = 28x + 6y$

$180 = 28x \cdot \cancel{6} \cdot \frac{28}{\cancel{6}} x$

$x = \frac{180}{56} \Rightarrow \boxed{x = 3,2}$

$\boxed{y = 14,72}$

(e)

~~TE~~

$TE = 3,2 - 4,5 = -1,3$

$SE = X_1 - X_2 = -$

$-\frac{y}{x} = -\frac{28}{6} = \frac{y}{x} = \frac{28}{6}$

$y = \frac{28}{6} x$

$U = x^{3/2} \cdot y^{1/3}$

Answer No 8

$Q(P) = \frac{161}{4} - \frac{23}{12} P$

$TC(Q) = \frac{10Q^2}{3}$

a) the total cost function is the combination of two variable and fixed costs

$w = \bar{w}$, $r = \bar{r}$ by minimizing

the procedure

$f(K, L)$

$TC = wL + rK$

$Tc(q) = \bar{w} L^P(q) = \hat{r} K^P(q)$

$\therefore TC(Q) = \frac{10Q^2}{3}$ 8

b) ; $AC = \frac{Tc(q)}{q}$

$AC = \frac{10\frac{Q^2}{3}}{q} = \frac{\frac{10}{3}Q^{\cancel{2}}}{\cancel{Q}} = \frac{10}{3}Q$

$MQ = \frac{\partial TC}{\partial Q} = 2 \cdot \frac{10}{3} Q = \frac{20}{3}Q$

$AR(Q) = \frac{TR(Q)}{Q}$

$\therefore TR = P(Q) \cdot Q$

$TR =$

$\boxed{MC = MR}$

c) = $QP = \frac{10Q^2}{3}$

$Q(P) = \frac{161}{4} - \frac{23}{12}P$

$\frac{23}{12}P = \frac{161}{4} - QP$

$P = \frac{161}{\cancel{4}} \cdot \frac{\cancel{12}^{3}}{23} - QP\frac{23}{12}$

$\boxed{P = \frac{483}{23} - QP\frac{23}{12}}$

$\pi = P(Q) \cdot Q - TC(Q) =$

$\boxed{\pi = \left(\frac{483}{23} - QP\frac{23}{12}\right) - 10\frac{Q^2}{3}}$

$\pi =$