No. :

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EE 320 HW3 Suggested answers

1. a). $\varepsilon_A = \frac{dQ_A}{dP_A}\left(\frac{P_A}{Q_A}\right) = \alpha_1 Q_A P_A^{-1}\left(\frac{P_A}{Q_A}\right) = \alpha_1$

$\varepsilon_{AB} = \frac{dQ_A}{dP_B}\left(\frac{P_B}{Q_A}\right) = \alpha_2 Q_A P_B^{-1}\left(\frac{P_B}{Q_A}\right) = \alpha_2$

$\varepsilon_Y = \frac{dQ_A}{dY}\left(\frac{Y}{Q_A}\right) = \beta Q_A Y^{-1}\left(\frac{Y}{Q_A}\right) = \beta$

b). $\alpha_1 < 0$, $\alpha_2 \in (-\infty, \infty)$

2. a). $f(kK, kL) = A(kK)^\alpha (kL)^\beta$

$= AK^\alpha L^\beta k^{\alpha+\beta}$

$= kAK^\alpha L^\beta = kf(K,L) = kQ$

b). $\frac{dQ}{dt} = \frac{\partial Q}{\partial K}\left(\frac{dK}{dt}\right) + \frac{\partial Q}{\partial L}\left(\frac{dL}{dt}\right)$

$= -\frac{\sigma\alpha Q}{K} + \eta\beta Q$

3. a). $\left.\frac{dw}{du}\right|_{\Delta v=0} = \frac{\partial w}{\partial x_1}\left(\frac{\partial x_1}{\partial u}\right) + \frac{\partial w}{\partial x_2}\left(\frac{\partial x_2}{\partial u}\right) + \frac{\partial w}{\partial u}$

$= 3\frac{\partial w}{\partial x_1} + v\frac{\partial w}{\partial x_2} + \frac{\partial w}{\partial u}$

$\left.\frac{dw}{dv}\right|_{\Delta u=0} = \frac{\partial w}{\partial x_1}\left(\frac{\partial x_1}{\partial v}\right) + \frac{\partial w}{\partial x_2}\left(\frac{\partial x_2}{\partial v}\right) + \frac{\partial w}{\partial v}$

$= 2v\frac{\partial w}{\partial x_1} + u\frac{\partial w}{\partial x_2} + \frac{\partial w}{\partial v}$

b). $\left.\frac{dw}{du}\right|_{\Delta v=0} = 5x_2\frac{\partial x_1}{\partial u} + (5x_1 - 16x_2)\frac{\partial x_2}{\partial u}$

$\left.\frac{dw}{dv}\right|_{\Delta u=0} = 5x_2\frac{\partial x_1}{\partial v} + (5x_1 - 16x_2)\frac{\partial x_2}{\partial v}$

4. $$\frac{\partial P^*}{\partial t_0} = -\frac{F_{t_0}}{F_{P^*}} = -\frac{\overset{\oplus}{D_{t_0}}}{\underset{\ominus}{D_p} - \underset{\oplus}{S_p}} > 0$$

$$\frac{\partial P^*}{\partial T_0} = -\frac{F_{T_0}}{F_{P^*}} = \frac{\overset{\ominus}{S_{T_0}}}{\underset{\ominus}{D_p} - \underset{\oplus}{S_p}} > 0$$

5. $$MRTS = \frac{MP_L}{MP_K} = -\frac{\beta}{\alpha}\left(\frac{K}{L}\right)^{1+\gamma}$$