Economics 1B
Suggested Solutions - Seminar 2

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Abstract

This guide is supposed to be complementary to the official solutions supplied by the lecturer. All errors are my own.

Question 1

a) $48x^3$ b) $6x + 4$ c) $9x^2 + \frac{4}{x^2} + 3$ d) $\frac{1}{\sqrt{x}} + \frac{6}{5}x^{\frac{-3}{5}} - \frac{4}{3}x^{\frac{-4}{3}}$

Question 2

a)

$$TC = \overbrace{2Q^3 - 12Q^2 + 20Q}^{\text{VC}} + \overbrace{3}^{\text{FC}}$$

b)

$$AVC = \frac{VC}{Q}$$
$$AVC = \frac{2Q^3 - 12Q^2 + 20Q}{Q}$$
$$AVC = 2Q^2 - 12Q + 20$$

c)

$$MC = \frac{\partial TC}{\partial Q} = 6Q^2 - 24Q + 20$$

Question 3

a)

$$MPL = \frac{\partial Q}{\partial L} = 90L^{\frac{-2}{3}} - 2$$

b)

$$\frac{\partial MPL}{\partial L} = \frac{\partial^2 Q}{\partial L^2} = -60L^{\frac{-5}{3}}$$

c) Yes, as you can see from your answer in b) the marginal product of Labour is decreasing. Furthermore it will even become negative for large values of L.

Question 4

a)

$$MPC = \frac{\partial C}{\partial Y} = 0.06\sqrt{Y} + \frac{0.1}{\sqrt{Y}}$$

b)

$$\begin{gathered} Y = C + S \\ \partial Y = \partial C + \partial S \\ \frac{\partial Y}{\partial Y} = \frac{\partial C}{\partial Y} + \frac{\partial S}{\partial Y} \\ 1 - \frac{\partial C}{\partial Y} = \frac{\partial S}{\partial Y} \\ MPS = 1 - 0.06\sqrt{Y} + \frac{0.1}{\sqrt{Y}} \end{gathered}$$

c) $MPC(4) = 0.17$ & $MPS(4) = 0.83$

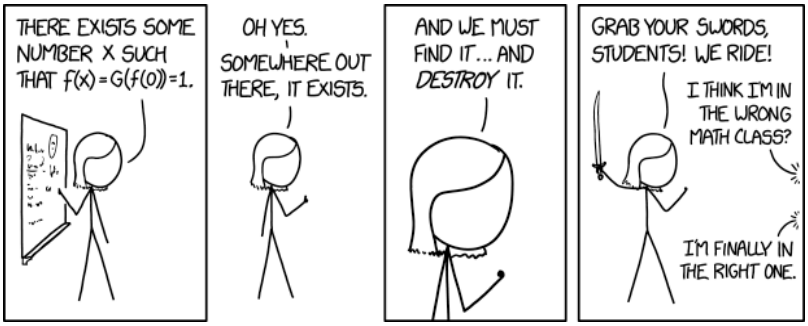

Figure 1: Source: https://xkcd.com