Chapter Eight: Problem Set

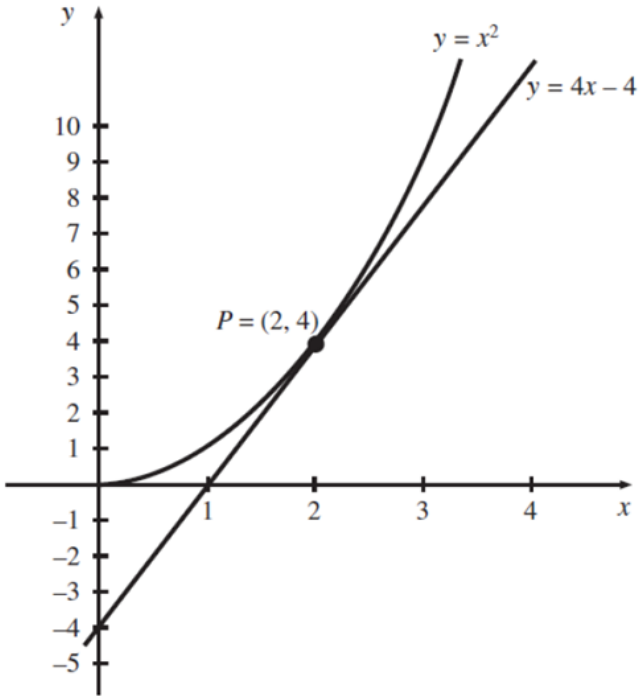
1. Give the reduced form of the following set of equations.

$$A = \beta_1 + \beta_2 + \beta_3$$

$$\beta_1 = (A, \lambda)$$

   Can an explicit reduced-form solution be obtained? Why?

2. Give the approximate and exact change in y when x goes from 2 to 3. What does this tell us about derivatives and differentials?



3. Find the total differential of the following functions.

   (a)
$$g(x_1, x_2) = ax_1 - bx_1x_2$$

   (b)
$$g(x_1, x_2) = x_1^2x_2^2 + ax_3$$

(c)

$$g(x_1, x_2) = x_1^a + x_2^b + x_1 x_2$$

4. Find the total *derivatives* $\frac{dy}{dq}$ of the following functions.

   (a)

   $$y = f(x, q) = 3x + xq - 2q$$

   where

   $$x = g(q) = q^2$$

   (b)

   $$y = f(x, q) = (xq)(2x - 3q)$$

   where

   $$x = g(q) = 5 - 2q$$

5. Find $\frac{\delta y}{\delta a}$ for the following equations and state whether they are explicit or implicit.

   (a)

   $$y^3 bc^2 + 2yb + 3c^3 = 0$$

   (b)

   $$y = 4a + bc + ac^2$$

6. Given the following model, determine the equilibrium values of the endogenous variables and show them as implicit functions of the other coefficients (π^*, y^*, i^*).

$$\pi - e - \lambda(y - o) - \epsilon_1 = 0$$

$$y - z + a(\pi - r - i) - \epsilon_2 = 0$$

$$i - k + \theta y = 0$$