2. Let the demand and supply functions be as follows:

(a) $Q_d = 51 - 3P$ (b) $Q_d = 30 - 2P$

$Q_s = 6P - 10$ $Q_s = -6 + 5P$

find P^* and Q^* by elimination of variables. (Use fractions rather than decimals.)

6. Find the equilibrium solution for each of the following models:

(a) $Q_d = Q_s$

$Q_d = 3 - P^2$

$Q_s = 6P - 4$

(b) $Q_d = Q_s$

$Q_d = 8 - P^2$

$Q_s = P^2 - 2$

1. Given the following model:

$Y = C + I_0 + G_0$

$C = a + b(Y - T)$ $(a > 0, \quad 0 < b < 1)$ [T: taxes]

$T = d + tY$ $(d > 0, \quad 0 < t < 1)$ [t: income tax rate]

(a) How many endogenous variables are there?

(b) Find Y^*, T^*, and C^*.

2. Let the national-income model be:

$Y = C + I_0 + G$

$C = a - b(Y - T_0)$ $(a > 0, \quad 0 < b < 1)$

$G = gY$ $(0 < g < 1)$

(a) Identify the endogenous variables.

(b) Give the economic meaning of the parameter g.

(c) Find the equilibrium national income.

(d) What restriction on the parameters is needed for a solution to exist?

3. The demand and supply functions of a two-commodity market model are as follows:

$Q_{d1} = 18 - 3P_1 + P_2$ $Q_{d2} = 12 + P_1 - 2P_2$

$Q_{s1} = -2 + 4P_1$ $Q_{s2} = -2 + 3P_2$

Find P_i^* and Q_i^* $(i = 1, 2)$. (Use fractions rather than decimals.)

8. Johnson invested \$1500, part of it at 15% interest and the remainder at 20%. His total yearly income from the two investments was \$275. How much did he invest at each rate?

4. Consider the macro model

$$\text{(i) } Y = C + \bar{I} + G, \qquad \text{(ii) } C = b(Y - T), \qquad \text{(iii) } T = tY$$

where the parameters b and t lie in the interval $(0, 1)$, Y is the gross domestic product (GDP), C is consumption, $\bar{I}$ is total investment, T denotes taxes, and G is government expenditure.

(a) Express Y and C in terms of $\bar{I}$, G, and the parameters.

(b) What happens to Y and C as t increases?

Question 5: *Tax and revenue.*

Let the demand function be $P = 14 - 3Q$ and the supply function be $P = 4 + 2Q$. Suppose that the government imposes tax by \$t per unit of output. This tax is assumed to impose on consumer. Answer the following questions.

a. (1 points) Find the equilibrium under pre-tax situation. That is, when "t" is set to equal to zero.
b. (1 points) State the condition that links between consumer's and producer's price.
c. (2 points) Find the equilibrium after tax. (Hint: your solution should be written in terms of "t".)

Question 1(Easy): Simple break-even analysis

1.1 Product A has a fixed cost at 5,000 Baht and variable cost for 7.5 baht per unit and price for 10 Baht per unit.

a) Construct the profit function of the producer of product A.
b) Determine break-even quantity and illustrate by the graph

1.2 Let TC = 2,000 + 20Q and price per unit is 40 Baht per unit. Determine the following:

a) Total revenue
b) Break-even quantity
c) If the company requires the minimum profit of 2,000 Baht, how many products company should produce?

Question 6 (moderate): Consider the ice cream market in Bangkok. In July, the ice cream market demand and supply curves are given by the following equations where Q is the quantity of ice cream units and P is the price in dollars per unit of ice cream:

Demand: Q = 14000 – 10P

Supply: Q = 2000 + 20P

a) Find the equilibrium price and quantity of ice cream in July.

b) Calculate the price elasticity of demand and supply at the equilibrium price in July. Use the point elasticity formula to compute the values of these two elasticity.

Suppose that the city of Bangkok imposes on producers an excise tax of B15 per unit of ice cream.

c) Calculate the new equilibrium price and quantity in **July** for this ice cream market.