Problem Set 3

Firm Supply and Industry Supply

1. Suppose that the cost curve of a firm is given by $c(y) = 2y^2 + 8$. The firm operates in a purely competitive market.

a. Characterize the shutdown condition of this firm! (What is the minimum price at which the firm is willing to produce a positive amount in the short run?)

b. Characterize the entry condition of this firm! (What is the minimum price at which the firm is willing to produce a positive amount in the long run?)

c. Characterize the short run supply curve of this firm!

d. Suppose that the price of the output is 10? Compute the surplus of the firm!

e. Suppose that the price of the output is 10? Compute the profit of the firm!

2. Suppose that in a competitive industry each firm has access to the same technology. The technology can be described by the following cost function: $c(y) = y^2 + 1$.

a. Suppose that there are n firms operating in this industry. What is the long run supply curve of these n firms?

b. Suppose that the market demand curve is $p = 20 - q$. How many firms are operating in the market in the long run?

c. Describe the industry supply curve!

d. Suppose that the demand grows over time, and becomes arbitrarily large. What will be the long run equilibrium price of the output?

3. Suppose that in the (competitive) market for apples each farmer uses the same technology and has his own land. The size of the land of each farmer is the same. The cost of production, ignoring the land, can be described by the following cost curve: $c(y) = 3y^2 + 8$. The market price of the apple is 20. What is the rental price of the land?