Problem Set # 7
Econ 2106H, J. L. Turner

1) Consider a firm in a perfectly competitive market with the following cost function:

$C = 2Q^3 - 4Q^2 + 5Q$ and therefore $MC = 6Q^2 - 8Q + 5$

a) Find the price and quantity associated with the (i) Shutdown point and (ii) Break even point.
b) What is the relationship between the shutdown point and the break even point?
c) What is the firm's Supply Function?
d) Suppose the firm's supply function is actually the Market Supply Function, and Market Demand is: $P = 95 - 4Q^2 - 8Q$. Find the Market Equilibrium.

2) Consider a firm with the following cost function:

$C = 50Q^3 - 20Q^2 + 10Q$ and therefore $MC = 150Q^2 - 40Q + 10$

Answer parts (a) - (d) from question (1). For part (d) assume the market demand curve is: $P = 165 - 5Q^2 - 40Q$

3) Consider a firm in a perfectly competitive market with the following cost function:

$C = Q^2 + 1$ and therefore $MC = 2Q$

a) Find the price and quantity associated with the Break even point and the shut-down point.

Now suppose there are 6 firms in this perfectly competitive industry, and assume each firm has the same cost function as above (i.e., $C = Q^2 + 1$ and therefore $MC = 2Q$). Assume the Market Demand for the product is $P = 60 - Q$.

b) Calculate the equation for short run Market Supply.
c) Calculate the short run Market Equilibrium.

4) Consider a market described by market demand $P = 300 - 3Q$. Suppose each firm in the industry has the following cost functions: $C = 20Q^2 + 180$ and therefore $MC = 40Q$.

a) Calculate each firm's Break even point and shut down point.

Suppose there are 20 firms in this industry with identical cost functions(i.e., : $C = 20Q^2 + 180$ and therefore $MC = 40Q$)

b) Calculate the short run Market Supply Curve
c) Calculate the short run Market Equilibrium.
d) Calculate the long run Market Equilibrium.