Problem Set #10

Sonoma State University Dr. Cuellar
Economics 305-Intermediate Microeconomic Theory

(1) Consider the following perfectly competitive market in which:
The industry demand is given by Q =1000-5P.
The typical firm's total cost is given by TC(q)= $300+\frac{q^2}{3}$. Assume this represents both the short run and long run costs of the firm.

(a) Derive the formula for average total cost.
(b) Derive the formula for average variable cost.
(c) Derive the formula for marginal cost.
(d) At what level of output is average total cost minimized?
(e) What is the per unit cost of the output at which average total cost is minimized.
(f) What is the shut down price for the representative firm?
(g) Derive the individual firm's supply curve, $s_i(P)$.
(h) Suppose there are 10 firms currently serving this market. Derive the market supply curve, $S(P)=\Sigma s_i(P)$.
(i) Set market supply equal to market demand and derive equilibrium price and quantity.
(j) At the equilibrium price derived in part (i), what is the profit maximizing output of each firm?
(k) What is the typical firm's profit or loss?
(l) Show graphically the short run equilibrium for the market and a representative firm.
(m) Explain the long run adjustment process.
(n) Derive the long run equilibrium price and quantity.
(o) How many firms will serve this market in the long run?
(p) Show graphically the long run equilibrium for the market and a representative firm.