Exercise chap 7

Q1: A firm operating in a perfectly competitive market has a total cost function TC=q2+3q+1. **This market has a demand function** of Qd=-2P+13 and a supply function of Qs=P+1. What is the maximum profit (or minimum losses) of this firm?

Qd=Qs ⬄ -2P+13=P+1

⬄ P=4 , Q=5

MC=2q+3

To maximize profit MC=P ⬄ 2q+3=4 ⬄ q=0.5

=P.q-( q2+3q+1)

=-0.75

Q2: A perfectly competitive market has **60 sellers and 80 buyers**. Each buyers has demand function P=164-20q, each seller has total cost function TC=3q(q+8). The maximum profit of each seller is?

80 buyers: Qd=qd.80 ⇔ qd=Qd/80 => Demand function: P=164-20.(Qd/80)

MC=6q+24

60 sellers: Qs=qs.60 ⇔ qs=Qs/60

MC=6.(Qs/60)+24

To maximize profit: P=MC ⇔ 164-0.25Q=0.1Q+24

⇔ Q=400 ; P=64

Profit= TR-TC=P.qs-3qs(qs+8)=133.33

Q3: There are 1000 identical firms in the perfectly competitive market, each firm has MC=q-5. **This market demand function** is Qd=20000-500P. What is the equilibrium price and quantity in this market?

* Find Qs?

To maximize profits in competitive markets, each firm set: P=MC

⇔ P=q-5 ⇔ q=P+5

There are 1000 identical firms => Qs=1000P+5000

* Qs=Qd => equilibrium price => P=10, Q=15000

Q4: A perfectly competitive market has the demand function Qd=800-20P, and a supply function Qs=-400+100P. A firm with a short run production cost STC=q2+4q+5 will have a maximum profit of?

P=10, q=3

Profit=4

Q5: Suppose you are the manager of a watchmaking firm operating in a competitive market. Your cost of production is given by C=200+2q2, where q is the level of output and C is total cost. (The marginal cost of production is 4q. The fixed cost of production is $200.)

1. If the price of watches is $100, how many watches should you produce to maximize profit?

q=25

1. What will the profit level be?

= 1050

1. At what minimum price will the firm produce a positive output?

AVC=2q

MC=4q

MC>AVC with all variables of q, therefore, firm will always produce positive output