Econ 301 **Homework #2** **K. Wainwright**

Answer Key

1. a) Find minimum AC: either set MC = AC or take derivative of AC and set = 0.
AC = $.01q^2 - 1.2q + 111$ $dAC/dq = 0.2q - 1.2 = 0$ $q = 60$
at q = 60, AC = 75 = Price in Long run equilibrium Q = 4500

b) 4500/60 = 75 firms

c) Licence fee does not change MC. Firm sets MC = P
$MC = 0.3q^2 - 2.4q + 111 = P (= 300 - 0.5Q)$
Let Q = 60q and sub into above
$0.3q^2 - 2.4q + 111 = 300 - 0.5(60q)$
$q^2 - 20q + 6300 = 0$ => $(q + 90)(q - 70) = 0$ => q =70 and p = 90

Gross profit (70x90) - 5320 = 980
Profit gets bid away on licence.

2. a) At min AC, q = 25 and AC = 125. Therefore P = $125
b) From the demand curve Q = 1500. 1500/25 = 60 firms
c) The minimum AC will shift up by 20% therefore the new long run price is P = (1.2)($125) = $150, and Q = 1400. therefore the number of firms = 56
d) the new longrun price is 125 + 50 = 175. Q = 1300 and firms = 52
e) For firms to increase from 60 to 63, market Q will increase to 1575 (63x25). From the demand curve, P = 106.25. Subsidy = 125 - 106.25 = $18.75

Chapter 10:

#3 a) MC = 10, y = 50, p = 60 and profit = 2500 - F
b) Entrant's demand $p = (110 - y_1) - y_E = 60 - y_E$
c) entrant's $MR = 60 - 2y_E = MC = 10$ $y_E = 25$, p = 35 entrant's profit = 625 - F
d) natural monoploy occurs for F > 625.

#9 a) the profit maximizing prices are $45 and $60. Profit =$382.50
b) any fixed fee that extracts CS above some price will work.
c) if $y \leq 3$ then P =90 - 10y and MR = 90 - 20y
if $y > 3$ then P = 70 - 10y/3 and MR = 70 - 20y/3
p* = 35 and profit = 367.59

chapter 11, #1
a) p = 280, q = 360 profit =64800
b) n = number of firms:
p = (460+100n)/(n+1) q = 720/(n+1) profit = 259200/(n+1)
c) each firm produces 180 and profit = 32400. violator would produce 270. Violators profit will increase by $4,050
d) The limit output is 560, limit price is $180 and profit is $44,800 - $3,200
e) There would be two firms, each earning $8,800
f) There would be 3 firms. profits of each = $1,600
g) One firm. Profit = $44,800