Perfect Competition and Monopoly Problems

#1:

Long-run average total cost = 240 – 6Q + 0.08Q2

Calculate the level of output when the average cost reaches a minimum:
When the average cost is minimized, its derivative is equal to zero. Therefore:
△ATC/△Q =0
-6 + 0.16Q = 0
0.16Q = 6
Q = 37.5 Units

Substitute in the ATC function to derive the long-run price:
240 – 6Q + 0.08Q^2 = 240 – 6(37.5) + 0.08(37.5)^2 = 127.5

The long-run price = 127.5

#2:

Q = 5000 – 250P (2500*0.8
Therefore, no. of drinks sold = 300 = 2300 Total revenue = Quantity * Price = 3000 * 0.8 = 2400
Total Profit = Revenue – Cost = 2400 – 2300 = $ 100