3 Extra Problems

Monday, February 1, 2021 6:13 PM

$P_1 = 20 - 1/4 q_1 \qquad P_2 = 20 - 1/2 q_2 \qquad Cost = \frac{1}{2}(q_1+q_2)^2 + 2\bar{q}$

$\bar{q}$ = capacity

$\Pi = (20 - 1/2 q_1)q_1 + (20 - 1/2 q_2)q_2 - 1/2(q_1+q_2)^2 - 2q_1$

$\frac{d\Pi}{dq_1} = 20 - q_1 - 1/2(q_1+q_2) - 2 = 0$

$\frac{d\Pi}{dq_1} = 20 - 1/2 q_1 - q_1 - q_2 - 2 = 0$

$\frac{d\Pi}{dq_2} = 20 - q_2 - (q_1+q_1) = 0$

$20 - 2q_2 = q_1$

Inverse demand is p=100-2q with probability 0.6 and otherwise it is p=80-2q. Cost is 20 per unit. Output not sold can be repurposed at a value of 5 per unit.

Determine quantities and prices for each state of demand and expected profit.

$\Pi = .6(100 - 2q_1)q_1 + .4(80 - 2q_2)q_2 - 20q_1 + (.4 \cdot 5)(q_1 - q_2)$

$\frac{d\Pi}{q_1} = \frac{-12x - 240}{5} \rightarrow = \frac{-32}{5} = 17.5$

$\frac{d\Pi}{q_2} = \frac{-8x - 150}{5} \rightarrow -\frac{75}{4} = 18.75$ ↛ ∴ $(q_H > q_L)$

try again

$\Pi = .6(100 - 2q)q + .4(80 - 2q)q - 20q$