Problem 10

Tuesday, February 9, 2021 6:09 PM

Inverse demand for movie tickets is:

p_s=16-0.01q_s for senior citizens and $.01q_s + p_s = 16 \quad .01q_s = 16 - p_s \quad q_s = \frac{16-p_s}{.01}$

p_A=24-0.01q_A for others. $q_A = \frac{24-p_A}{.01}$

The marginal cost of serving one more movie goer is $4.

Determine the profit maximizing prices for each type of customer.

$\pi = (16 - .01q_s)q_s + (24 - .01q_A)q_A - 4(q_s + q_A)$

$\frac{d\pi}{q_s} = 12 - \frac{q_s}{50} \Rightarrow \frac{q_s}{50} = 12 \Rightarrow q_s = 12 \cdot 50 = 600 = q_s$

~~I'm definitely missing the $q_H > q_L$ step~~

↓

	A	B	C	D	E
1		Quantity	Price	Cost	Total
2	Senior	600.000016	9.99999984	2400.00007	3600
3	Other	1000.00001	13.9999999	4000.00002	10000
4	A bit of solver to make sure I'm on the right track				13600

$\frac{d\pi}{q_A} = 20 - \frac{q_A}{50} \Rightarrow \frac{q_A}{50} = 20 \quad q_A = 1000$

I'm not sure this is right.

$p_s = 16 - .01(600) = 10 = p_s$
$p_A = 24 - .01(1000) = 14 = p_A$

~~$\pi_{max} = 1700$~~

$\pi = (10 \cdot 600) + (14 \cdot 1000) - (4 \cdot 1600) = 13600$

↑
$q_A + q_s$