中级微观经济学

第二次测验

原始版

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一. 定价问题

1. 设y的价格为1，x为p

$L(x,y,\lambda) = x - \frac{1}{2}x^2 + y + \lambda(px + y - m)$

$$\begin{cases} \frac{\partial L}{\partial x} = 1 - x + \lambda p \\ \frac{\partial L}{\partial y} = 1 + \lambda \\ px + y - m = 0 \end{cases} \Rightarrow \begin{cases} \lambda = -1 \\ x = 1 - p \end{cases}$$

$\therefore D(x) = 100x = 100 - 100p$

2. $I(p) = 100p(1-p) \Rightarrow p = \frac{1}{2}$ $I = 25$

二. 弹性

设 $x = 2x_1$，则：

$$\varepsilon = \frac{p}{X}\frac{dx}{dp} = \sum_{p=1}^{100} \frac{p}{x_i}\frac{dx_i}{dp} = \frac{1}{2}\left(\frac{p}{x_1}\sum_{p=1}^{75}\frac{dx_i}{dp} + \frac{p}{x_1}\sum_{p=76}^{100}\frac{dx_i}{dp}\right) = 2.5$$

∴ 弹性为 2.5

三. 利润最大化

$p = 100 + 4A^{\frac{1}{2}} - 3Q$

$C = 4Q^2 + 10Q + A$

$\pi = pQ - C$

$= (100 + 4A^{\frac{1}{2}})Q - 7Q^2 - 10Q - A$

对A求偏导：$Q = \frac{4 + 2A^{-\frac{1}{2}}}{7}$ 时取 max

$\therefore \pi = \frac{25A - (40 + 4A^{\frac{1}{2}})^2}{28}$

$\frac{\partial \pi}{\partial A} = \frac{1}{14}(40 + 4\sqrt{A}) \cdot \frac{2}{\sqrt{A}} - 1 = 0$

$\Rightarrow A = 900$

$\therefore Q = 15$，$\pi = 675$，$p = 175$

四.行业供给问题

① $p\le 10 \Rightarrow p=10$　仍有 $6+0.0005Q=P \Rightarrow Q=8000$

$\therefore \Delta x = 27900-1500\times 10-8000 = 4900 \Rightarrow$ 进口

② $n=\frac{8000}{80}=100$

③ $p\le 12 \Rightarrow$ 跟①是一样的　$\Delta x = 4900$

④ $p=10,\ Q=8000$

⑤ $n=\frac{8000}{80}=100$

⑥ 长期利润为0

⑦ 前　$p=10$　$x=12900$

后:　$p=11.4$　$x=10800$

$n=(11.4-10)\times\frac{10800+12900}{2}=16590$

⑧ 无进口，$n=0$