

0.1 Exercise 2:

$$\begin{aligned}
 Q_o &= 400p - 100; \quad Q_d = 1100 - 200(p + t) \\
 &\rightarrow \epsilon_d = -\frac{\partial D_d}{\partial p} * \frac{p}{Q} = -(-200 \frac{p}{Q}) \\
 &\rightarrow p_o = \frac{Q_o}{400} + \frac{1}{4}; \quad p_d = \frac{1100 - Q_d}{200} - t \\
 Q_o = Q_d &\leftrightarrow p^* = 2 - \frac{1}{3}t; \quad Q^* = 700 - \frac{400}{3}t \\
 &\rightarrow \epsilon_d = 200 \frac{2 - \frac{1}{3}t}{700 - \frac{400}{3}t} = \frac{2(6 - t)}{21 - 4t}
 \end{aligned}$$

Surplus consommateur:

$$\begin{aligned}
 S_c &= \int_0^{Q^*} (p_d - p^*) dq \\
 &= \frac{1}{400} \left(700 - \frac{400}{3}t \right)^2
 \end{aligned}$$

Surplus producteur:

$$\begin{aligned}
 S_p &= \int_0^{Q^*} (p^* - p_o) dq \\
 &= \frac{1}{800} \left(700 - \frac{400}{3}t \right)^2
 \end{aligned}$$

Donc les cas specials:

$$\begin{aligned}
 t = 0 &\rightarrow p^* = 2; \quad Q^* = 700; \quad \epsilon_d = \frac{4}{7}; \quad S_c = 1225; \quad S_p = 612.5 \\
 t = 1 &\rightarrow p^* = \frac{5}{3}; \quad Q^* = \frac{1700}{3} = 566.66...; \quad S_c = 802.8; \quad S_p = 401.4 \\
 Q^* = 500 &\rightarrow t^* = \frac{6}{4} = \frac{3}{2} = 1.5; \quad p^* = \frac{3}{4} = .75
 \end{aligned}$$

0.2 Exercise 3:

$$Q_{oo} = 18p - 1000; \quad Q_{do} = 9000 - 22p$$

$$Q_{ot} = 14p - 800; \quad Q_{dt} = 4000 - 16p$$

$$\rightarrow \epsilon_{do} = -\frac{\partial D_d}{\partial p} * \frac{p}{Q} = 22 \frac{p_o^*}{Q_o^*}$$

$$\rightarrow \epsilon_{dt} = -\frac{\partial D_d}{\partial p} * \frac{p}{Q} = 16 \frac{p_t^*}{Q_t^*}$$

$$Q_{oo} = Q_{do} \leftrightarrow p_o^* = 250; \quad Q_o^* = 3500$$

$$Q_{ot} = Q_{dt} \leftrightarrow p_t^* = 160; \quad Q_t^* = 1440$$

$$Q_{oo} = 8p - 900; \quad Q_{do} = 9000 - 22p$$

$$\rightarrow \epsilon_{do} = -\frac{\partial D_d}{\partial p} * \frac{p}{Q} = 22 \frac{p_o^*}{Q_o^*}$$

$$Q_{oo} = Q_{do} \leftrightarrow p_o^* = 330; \quad Q_o^* = 1740$$