EC3322
Industrial Organization I
Semester 1, 2015-2016
Tutorial #3

SOLUTIONS

2. (a) $F(p) = \dfrac{(1-p)^2}{2}$

   (b) $\pi(p) = (p-c)(1-p) + \dfrac{(1-p)^2}{2}$

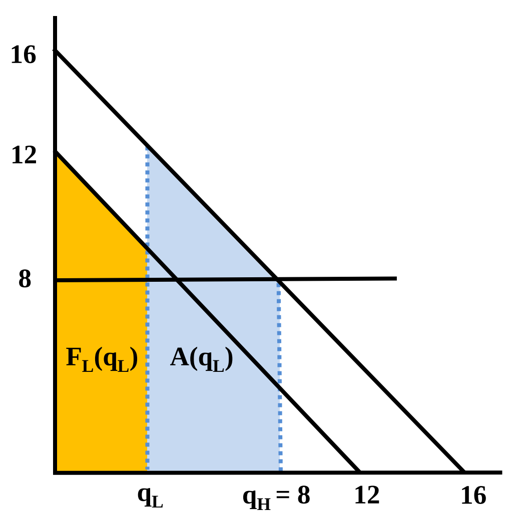
   (c) $p^* = c$

   (d) $F^* = \dfrac{(1-c)^2}{2}$

3. The optimal block pricing packages under second-degree price discrimination will have the following features:

   - The quantity of the high demand package is the efficient amount of quantity for the high demand person.
   - The low-demand persons will receive no consumer surplus.
   - The high-demand person receives the same surplus from buying the high demand package as from buying the low demand package.

   With this information we can draw the graph:



Notice, that using the above information, we can write the fees and quantities as a function of a single variable, q_L (the number of units in the low-demand package). From the graph, $F_L(q_L) = 12q_L - \frac{1}{2}q_L^2$ and $A(q_L) = 96 - 16q_L + \frac{1}{2}q_L^2$. The fee for the high-demand package is then $F_H(q_L) = F_L(q_L) + A(q_L) = 96 - 4q_L$.

The monopolist's profit is

$$\pi(q_1) = 2F_L(q_L) + F_H(q_L) - 8(8 + 2q_L) = 4q_L - q_L^2 + 32.$$

Maximize profit to find $q_L^* = 2$. The fees are found by plugging in for q_L.

4. (a) Under first-degree price discrimination, the firm sets $P = MC$ and charges a fee, F, that equals the consumer surplus under uniform pricing: $P_T = 1$, $F_T = 5$ and $P_L = 1$, $F_L = 1$.

   (b) Consider first that the firm offers two packages. Under second-degree price discrimination, the high demand customer receives the efficient amount of quantity, the low demand customer's willingness to pay is completely extracted, and the high demand customer receives CS equal to the amount he would receive if he bought the low demand package: $q_T = 3, F_T = 6$ and $q_L = 1, F_L = 2$. This package earns profits $= 4$. However, note that the firm can offer a single package of $Q_T = 3, F_T = 8$ (or $Q_T = 2, F_T = 7$), with $\pi = 5$. So the firm offers a single package designed for tourists, and the locals do not visit Legolandia.