Designing profit maximizing plans (review)

The monopolist knows the proportion of high and low demanders but not who is who. Or even if she knows, it is illegal to offer different plans to different people. The monopolist thus offers 2 plans. Each plan is a pair \((F_j, t_j)\) \(j = 1, 2\) where the first term is the access fee and the second is the user fee. Total payment for \(q\) units is then \(R = F + t_j q\). For any customer who is purchasing plan \(j\), the access fee does not affect the marginal decision.

\[
U_i(q) = B_i(q) - R = \int_0^q p_i(x)dx - R
\]

\[
\frac{d}{dq} U_i(q) = \frac{dB_i}{dq} - \frac{dR}{dq} = p_i(q) - t_j
\]

\[
MB - MC
\]