1. Under a Bayesian hypothesis testing setup, let $\pi_i = Pr(H_{0i} \text{ is true}|data)$ be the posterior probability of the $i$th null hypothesis being true, $i = 1, \ldots, m$. Suppose the $H_{0i}$ is rejected if $\pi_i < \pi^*$ for a given value of $\pi^*$. Show that the posterior expected number of false discoveries

$$FD(\pi^*) = \sum_{i=1}^{m} \pi_i I(\pi_i < \pi^*).$$