LAB #3 – SELECTED ANSWERS

2.(e) $P(\text{win prize}) = P(\text{Bag 0})P(\text{"Bag 0"} \mid \text{Bag 0}) + P(\text{Bag 1})P(\text{"Bag 1"} \mid \text{Bag 1})$
$= .80\,P(\text{Bag 0}) + .50\,P(\text{Bag 1}).$

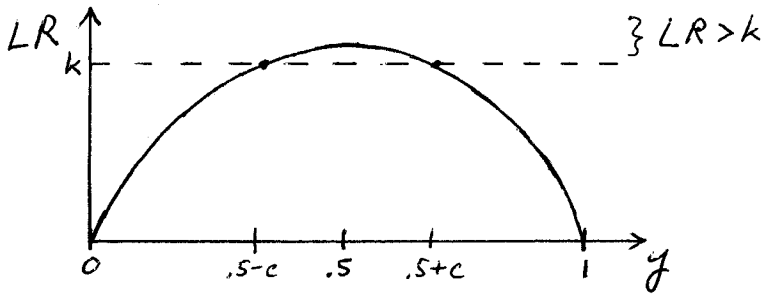
It is not possible to evaluate this without knowing $P(\text{Bag 0})$ and $P(\text{Bag 1})$.

3. Select items in order of their ratios until you have "spent" the entire "budget".

4. Let $LR = f_1(y)/f_0(y) = 6y(1-y)$.

a) (i) LR is maximized at $y = .5$ (see figure below)

(ii) LR is minimized at $y = 1$ ($y = 0$ is out of the domain)



b) Choose f_1 if y falls in the interval $.5 \pm c$, where $P_{f_0}(Y \in (.5-c, .5+c)) = \int_{.5-c}^{.5+c} 2y\,dy = \ldots = 2c = .1 \Rightarrow c = .05$.

So reject $f_0 \Leftrightarrow Y \in (.45, .55)$.

c) Proceeding as in part (b), we must solve

$$\int_{.5-c}^{.5-c} 2y\,dy = 2c = \alpha \Rightarrow c = \frac{\alpha}{2} \Rightarrow \text{reject } f_0 \text{ if}$$

$$Y \in \left(.5 - \frac{\alpha}{2},\ .5 + \frac{\alpha}{2}\right).$$