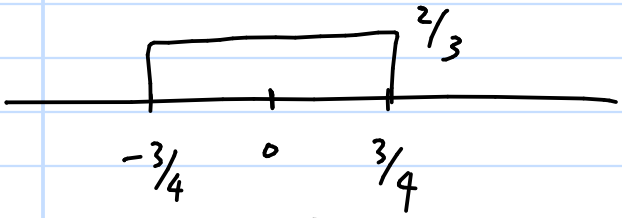
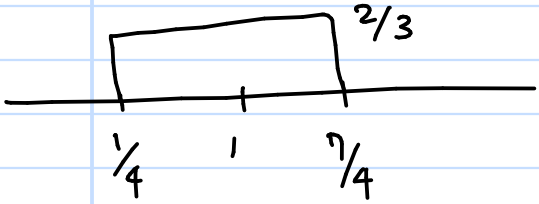
1) $P_{Y|H}(y|H_0)$



$P_{Y|H}(y|H_1)$

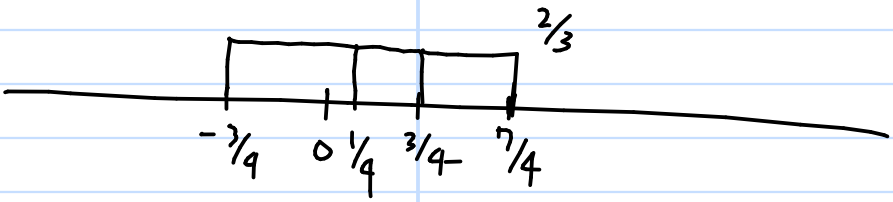


2)

$P_0 = 1/4$

$P_1 = 3/4$

$\eta = \frac{P_0}{P_1} = 1/3$



region 1) $-\frac{3}{4} < y < \frac{1}{4}$ $= 0$ 0 H_0

2) $\frac{1}{4} < y < \frac{3}{4}$ $\frac{P_{Y|H}(y|H_1)}{P_{Y|H}(y|H_0)} = \frac{2/3}{2/3} = 1$ $1 > 1/3$ H_1

3) $\frac{3}{4} < y < \frac{7}{4}$ $= \infty$ $\infty > 1/3$ H_1

3) $P(\frac{1}{4} < y_0 < \frac{3}{4}) \int_{1/4}^{3/4} 2/3 \, dy = \left[\frac{2}{3}y\right]_{1/4}^{3/4} = \frac{6}{12} - \frac{2}{12} = \frac{1}{3}$

$P_r[\text{Error}] = P(H_0) \cdot P(\frac{1}{4} < y_0 < \frac{3}{4}) = \frac{1}{4} \cdot \frac{1}{3} = \frac{1}{12}$

4)