

From WMS, do 10.91 and 10.109. Also, complete the following extra problem (EP).

EP1. Suppose that  $Y_1, Y_2, \dots, Y_n$  is an iid sample from

$$f_Y(y; \theta) = \begin{cases} \theta(1-y)^{\theta-1}, & 0 < y < 1 \\ 0, & \text{otherwise.} \end{cases}$$

- (a) Derive the level  $\alpha$  likelihood ratio test of  $H_0 : \theta = 1$  versus  $H_a : \theta \neq 1$ .
- (b) Derive the power function  $K(\theta)$ .
- (c) Use R to plot  $K(\theta)$  when  $n = 10$  and  $\alpha = 0.10$ . Compute  $K(0.8)$  and  $K(1.5)$ .

**Note:** For additional practice, do 10.98, 10.105, and 10.106 in WMS. These are not to be turned in (but I will provide solutions).