1. Under H_0, a random variable X has the CDF $F_0(x) = x^2$, $x \in [0, 1]$; and under H_1, it has the CDF $F_1(x) = x^3$, $x \in [0, 1]$.

   (a) Find LRT

   (b) Find Power

2. Consider two probability density functions on $[0, 1] : f_o(x) = 1$, and $f_1(x) = 2x$. Among all tests of the null hypothesis $H_0 : X \sim f_0$ versus $H_1 : X \sim f_1$, with significance level $\alpha = 0.1$, how large and the power possibly be?