Problem 1. *Let $X_1, \ldots, X_n$ be i.i.d. random variables with the density function*

$$f(x|\theta) = (\theta + 1)x^{\theta}, \qquad 0 \leq x \leq 1$$

a. *Find the method of moments estimator of θ.*

b. *Find the MLE of θ.*

c. *Find the asymptotic variance of the MLE.*

Problem 2. *Let $X_1, \ldots, X_n$ be i.i.d. uniform on $[0, \theta]$.*

a. *Find the method of moments estimate of θ.*

b. *Find MLE of θ*

c. *Find mean and variance of MLE.*