133. Consider a random sample $X_1, ..., X_n$ from a gamma(α, β) parent population, with the value of α being known. The MLE of β is

$$\hat{\beta} = \frac{\bar{X}}{\alpha}.$$

(a) Find the method of moments estimator (MME) of β if α is known.

(b) Find the mean squared error (MSE) of the MLE and the MME.

(c) Based on the MSEs of the two estimators, should one estimator be preferred over the other? Explain.