Problem #5

a) Since all values are equally likely, the high limit of the support is the maximum likelihood estimator

$$\max(X_1, \ldots\ldots X_n) = 2\theta + 1$$

$$X_n = 2\theta + 1$$

$$\theta = \frac{X_n - 1}{2}$$

$$\hat{\theta} = \frac{\hat{X}_n - 1}{2}$$

b) $$\mathrm{Var}(\hat{\theta}) = \frac{1}{4}\mathrm{Var}(\hat{X}_n - 1)$$

$$= \frac{1}{4}\mathrm{Var}(\hat{X}_n)$$