MATH 358/658 Assignment 8

1. Let $X_1, ..., X_n \sim Exp(\beta)$. Define three estimators of $g(\beta) = 1/\beta$ as:

$$\begin{aligned} \hat{\beta}_1 &= X_1 \\ \hat{\beta}_2 &= \frac{1}{n}\sum_{i=1}^{n} X_i \\ \hat{\beta}_3 &= n \cdot \min(X_i) \end{aligned}$$

   For each estimator, find the bias and variance. Then, compute the MSE of each and decide which is best. One hint: If $X_1, ..., X_n \sim Exp(\beta)$, then $\frac{1}{n}\sum_{i=1}^{n} X_i \sim \text{Gamma}(n, n\beta)$.

2. #8 on page 513. Hint: call $t = 1 - p$, and observe that $1 = 1 + 0 \cdot t + 0 \cdot t^2 + 0 \cdot t^3 + ...$

3. #11 on page 513.

4. #2 on page 527.

5. #4 on page 527.