1. 5 points. Suppose $Y$ is a scalar observation drawn from a parameterized Poisson distribution

$$p_Y(y; \theta) = \text{Prob}(Y = y) = \frac{\theta^y e^{-\theta}}{y!}$$

for $y = 0, 1, 2, \ldots$. Find the Fisher information $I(\theta)$ and the CRLB for estimating the scalar parameter $\theta$. Confirm all of the regularity conditions are satisfied. Can you find an MVU estimator that achieves the CRLB in this case?

2. 4 points. Kay I: 3.3. Confirm all of the regularity conditions are satisfied.

3. 4 points. Kay I: 3.4. You can assume all of the regularity conditions are satisfied.

4. 4 points. Kay I: 3.9. You can assume all of the regularity conditions are satisfied.

5. 4 points. Kay I: 3.12.

6. 4 points. Kay I: 3.17. This is an extension of example 3.14, so you can assume all of the regularity conditions are satisfied.