Sheet 7: Point Estimation

NOTE: All results should be rounded to two decimal places unless otherwise stated. If a number or result has fewer decimal places, it is okay to keep fewer. For probabilities, give two decimal places when expressed in percentage (e.g., 12.34%) and four decimal places when expressed as numbers (e.g., 0.1234).

Exercise 1
[D, Section 6.1, Exercise 4]
In b: only variance and standard error, no need to compute the estimated standard error

Exercise 2
[D, Section 6.1, Exercise 15]

Exercise 3
[D, Section 6.2, Exercise 22 a]

Exercise 4
[D, page 274, Ex 32 (in b, only do the "but ..." part)]

Exercise 5
Let $X_1, \ldots, X_n$ be iid and U($[a, b]$)-distributed with unknown parameters $\theta_1 = a$ and $\theta_2 = b$.

(a) Use the method of moments to derive estimators $T^{(1)}$ and $T^{(2)}$ for θ_1 and θ_2, respectively.

(b) Are $T^{(1)}$ and $T^{(2)}$ consistent for θ_1 and θ_2, respectively? Justify your answer.

Exercise 6 Read the proof of the Proposition on p. 253 and show that for an estimator T, we have $MSE(T) = V[T] + (Bias(T))^2$.

Exercise 7 Let $X_1, \cdots, X_n$ be iid Bernoulli(p). Show that there is no unbiased estimator of $\theta = \log(p)$