I. **Sections to Read** (All content from DeGroot and Schervish's *Probability and Statistics* unless otherwise noted) A digital copy of the textbook is available for on our class PWeb site, under the Day One Access tab.

(a) Reread Section 7.5 (focus on the section discussing limitations of the Maximum Likelihood Estimator, 422 - 425)

(b) Read Section 7.6 (just the section on Invariance and Consistency, 426 - 428)

II. **Objectives** (By the end of the day's class, students should be able to do the following:)

- Describe several limitations of the Maximum Likelihood Estimator.
- State the invariance property of the MLE, both for one-to-one and general functions, and explain why this is a useful property of an estimator.
- State the consistency property of the MLE, and explain why this is a useful property of an estimator.

III. **Reflection Questions** (Submit answers on Gradescope `https://www.gradescope.com`)

1) Suppose observations $X_1, \ldots, X_n$ form a random sample where the X_i are iid Expo(λ). Explain how to use the invariance property of the maximum likelihood estimator $\hat{\lambda}$ for λ in order to obtain a maximum likelihood estimator for the mean of the Expo(λ) distribution.

2) In your own words, explain why it might be useful to have a consistent estimator for a parameter θ.

IV. **Additional Feedback** Are there any topics you would like further clarification about? Do you have any additional questions based on the readings / videos? *If not, you may leave this section blank.*