Pre-class preparation

Optional: Parts of the new material for this class will build on Taylor series. If you would like a quick refresher on power series and Taylor series, please either review your notes from Calc II or watch this video here:

- Video: Taylor series

Please watch the following video OR read the following textbook sections from Blitzstein and Hwang's *Introduction to Probability* (second edition) :

- Video: Moment Generating Functions

- Textbook: Section 6.4

Objectives

By the end of the day's class, students should be able to do the following:

- State the definition of the moment generating function for a random variable.

- Compute the moment generating function for a variety of named distributions.

- Use the moment generating function to compute the moments of a random variable.

- Identify a random variable by recognizing its moment generating function.

- Use location-scale properties of the moment generating function to find the MGF of a transformation of a variable.

- Compute the moment generating function for a sum of independent random variables.

Reflection Questions

Please submit your answers to the following questions to the corresponding Canvas assignment by 7:45AM:

1. True or false (and why)? If X is a degenerate random variable (i.e. $P(X = c) = 1$ for some $c \in \mathbb{R}$), then the MGF of X is a constant function.

2. Explain why the domain of the MGF for any random variable always contains at least 1 point. Then discuss why the value of the MGF at this point doesn't give any useful information about the random variable.

3. (Optional) Is there anything from the pre-class preparation that you have questions about? What topics would you like would you like some more clarification on?