**Homework Simulating Sampling Distributions.**

**Some definitions:**



The kurtosis for the standard normal is **3.** So often (almost always?) the measure used for samples is kurtosis-**3** (or excess kurtosis) and provides a comparison to the standard normal.

It is known that the estimate of kurtosis is biased for small samples. We can examine this using distributions with known values of kurtosis and simulate the small sample case.

1. Create a dataset, work.simsk, that contains 1,000 samples of size 50 from each of four distributions. The standard normal, a t-distribution with 5 degrees of freedom, an exponential distribution, and a log normal distribution (generate a random, x, with from a normal distribution with mean zero and standard deviation .503 and take ex as the random observation for the log normal). The standard normal distribution is known to have kurtosis 0. The other three distributions have kurtosis 6.
2. Use proc means to create a dataset, work.moments, that contains the kurtosis values for each of the for variables in simsk.
3. Use the following code to create a “long” version of the work.moments data set:

proc transpose data=Moments out=Long(rename=(col1=Kurtosis));

by SampleID;

run;

1. Use proc sgplot to create the following figure.

