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|  | **Population** | **One Simple Random Sample y1, y2, ... , yn of size n** | **All Simple Random Samples of size n** |
| **Associated Random Variable** | Y | Y | The population for is all simple random samples of size n from Y. The value of for a particular simple random sample is the sample mean  for that sample. |
| **Associated Distribution** | Y *has* a normal distribution. | The sample is *from* the (normal) distribution of Y. | The distribution of  is called the *Sampling Distribution.* The theorem tells us that the sampling distribution is normal.  |
| **Associated Mean(s)** | Population mean µ, also called E(Y), or the expected value of Y, or the expectation of Y | Sample mean  = (y1+ y2+ ... + yn)/nIt’s an estimate of µ.  | Since it’s a random variable, also has a mean, E(). The theorem tells us that E() = µ. (In other words, the random variables Y and Ȳn have the same mean – i.e., E() = E(Y) = µ.) |
| **Associated Standard Deviation** | *Population standard deviation* σ | *Sample standard deviation*s = s is an estimate of the population standard deviation *σ* | *Sampling distribution standard deviation.* The theorem tells us that the standard deviation of the sampling standard deviation is. |