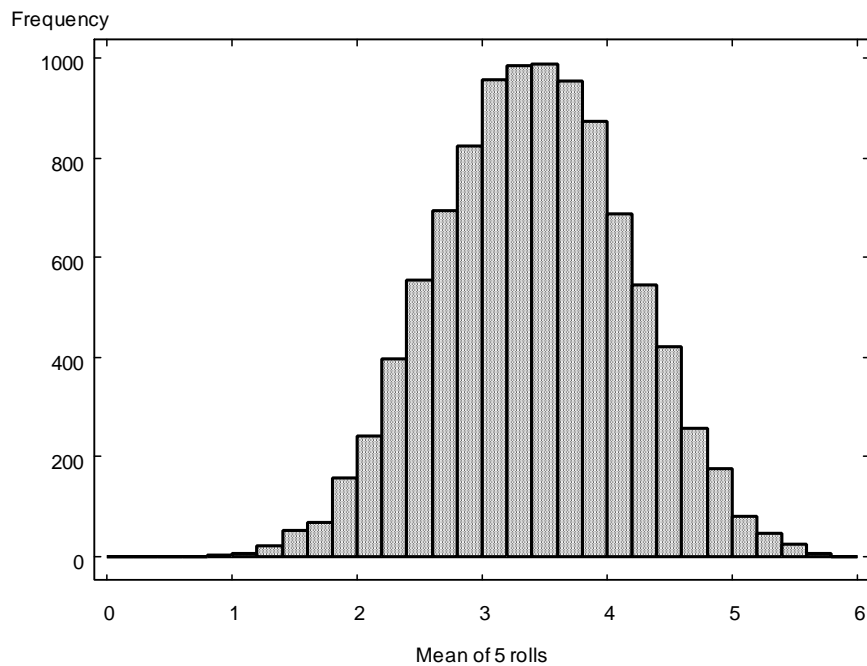


Section 6.3 - Sampling Distributions

The **sampling distribution of a statistic** is the distribution of all values of the sample statistic when all samples of size n are taken from the same population.

Here is an example to help us understand the *sampling distribution of the mean*:

1. Roll a die 5 times.
2. Let the random variable x be the mean value of the 5 rolls.
Find x .
3. Repeat the 5-roll experiment many times and keep a record of the values of x .
4. The distribution of the variable x is the sampling distribution of the mean.
5. The sampling distribution could be represented by a table, probability histogram, or formula.



Two important properties of the *sampling distribution of the mean*:

1. The sample means *target* the population mean. (The mean of the sample means is the population mean.)
2. The distribution of sample means is approximately normal.

Two important properties of the *sampling distribution of the variance*:

1. The sample variances *target* the population variance.
2. The distribution of sample variances tends to be skewed right.

Two important properties of the *sampling distribution of a sample proportion*:

1. The sample proportions *target* the population proportion.
2. The distribution of sample proportions is approximately normal.

See summary table on Page 255.

Biased and Unbiased Estimators

These statistics are unbiased estimators--they target the value of the corresponding population parameter.

- Mean
- Variance
- Proportion

These statistics are biased estimators--they do not target the value of the corresponding population parameter.

- Median
- Range
- Standard deviation (It's close though!)