

## Section 9.4 - Two Variances

For two normally distributed populations with equal variances, the sampling distribution of the test statistic  $F = s_1^2/s_2^2$  is the **F distribution**.

1. The  $F$  distribution is not symmetric.
2. Values in the  $F$  distribution cannot be negative.
3. The shape of the distribution depends on two different degrees of freedom.
4. Large values of  $F$  are evidence against  $\sigma_1^2 = \sigma_2^2$ .

In this section, we test the hypothesis that two population variances are equal.

For the requirements and formulas, see the table on page 453. The populations must be normally distributed!

## Example

At a certain urban hospital, the standard deviation in the waiting times to see an ER doctor for a non-life-threatening emergency is 32 minutes. At a second hospital, the standard deviation is 28 minutes. The sample sizes are 16 and 18, respectively. Assume that the populations of waiting times are normally distributed. Does the evidence suggest that there is more variation in the waiting times at the first hospital?