c. If testing the claim that $\sigma_1^2 \neq \sigma_2^2$, what do we know about the two samples if the test statistic is $F = 1$?

2. *F* Test If using Data Set 1 in Appendix B for a test of the claim that heights of men and heights of women have different variances, we find that $s = 6.60$ cm for women and $s = 6.02$ for men.

a. Find the values of s_1^2 and s_2^2 and express them with appropriate units of measure.

b. What is the null hypothesis?

c. Find the value of the F test statistic and round it to four decimal places.

d. The P-value for this test is 0.2550. What do you conclude about the stated claim?

3. Robust What does it mean when we say that the F test described in this section is *not robust* against departures from normality? Is the F test robust against sampling methods that do not produce simple random samples?

4. Testing Normality Students of the author randomly selected 217 student cars and recorded their ages, and they randomly selected 151 faculty cars and recorded their ages. If using the F test with these data, is it correct to reason that there is no need to check for normality because $n_1 > 30$ and $n_2 > 30$?

Hypothesis Test of Equal Variances. ***In Exercises 5 and 6, test the given claim. Use a significance level of $\alpha = 0.05$ and assume that all populations are normally distributed.***

5. Coke Versus Pepsi Data Set 19 in Appendix B includes the weights (in pounds) of samples of regular Coke and regular Pepsi. If we use a TI-83/84 Plus calculator to test the claim that weights of regular Coke and weights of regular Pepsi have different standard deviations, we get the results shown in the accompanying display. Use those results with a 0.05 significance level to test that claim.

TI-83/84 PLUS

```
2-SampFTest
 σ1≠σ2
 F=1.734067094
 p=.1081070292
 Sx1=.007507372
 Sx2=.005701052
↓x̄1=.8168222222
```

6. Ages of Faculty and Student Cars Students of the author randomly selected 217 student cars and found that they had ages with a mean of 7.89 years and a standard deviation of 3.67 years. They also randomly selected 152 faculty cars and found that they had ages with a mean of 5.99 years and a standard deviation of 3.65 years. Using a significance level of 0.05, is there sufficient evidence to support the claim that ages of student cars vary more than the ages of faculty cars? Use the results from the accompanying StatCrunch display.

STATCRUNCH

Hypothesis test results:

σ_1^2 : variance of population 1
σ_2^2 : variance of population 2
σ_1^2/σ_2^2 : variance ratio
H_0 : $\sigma_1^2/\sigma_2^2 = 1$
H_A : $\sigma_1^2/\sigma_2^2 > 1$

Ratio	n1	n2	Sample Ratio	F-Stat	P-value
σ_1^2/σ_2^2	217	152	1.010989	1.010989	0.4745

Hypothesis Tests of Claims About Variation. ***In Exercises 7–16, test the given claim. Assume that both samples are independent simple random samples from populations having normal distributions.***

7. Color and Cognition Example 1 in this section included results from a study of the effects of color on creativity, and the results below were used to study the effects of color on cognition. Words were displayed on a computer screen with background colors of red and blue. Results from scores on a test of word recall are given below. Use a 0.05 significance level