Assignment #2: Comparing two variances

Scenario: A hospital must select between two blood pressure monitors. After careful calibration, they test each monitor 20 times. The first monitor, an inexpensive armband-pump device, had a variance in measurements of 36 units. The second monitor, an expensive automated device, had a variance of 9 units. Which monitor should the hospital choose?

1. Complete the following to conduct an F-test (using a 0.05 significance level) comparing the variances in readings from the two monitors.

   Null hypothesis: _____ Alternative hypothesis: _____

   Calculate the F-statistic comparing the larger sample variance to the smaller sample variance:

   F =

   Numerator degrees of freedom = _____ Denominator degrees of freedom = _____

   The F-statistic you calculated from the two samples of n=20 observations is one of an **infinite** number of F-statistics you *could have* calculated (from different random samples from each population). Assuming the null hypothesis is true, sketch the distribution of all possible F-statistics you could have calculated from different random samples of size n=20.

   _____

   Distribution of all possible F-statistics if null hypothesis is true

   Locate your observed F-statistic (the one you calculated earlier) on that distribution. Estimate and interpret the p-value using: http://lock5stat.com/statkey/theoretical_distribution/theoretical_distribution.html#F.

   p = _____ Interpretation: _____

   _____

   What assumptions, if any, are you making when you conduct this F-test?

   Assumptions: _____