Question 8

Here we are interested in testing the following hypotheses

H0: σprior = σnew

HA: σprior > σnew

To test this, we can use the F distribution. The equivalent process here is to look for

H0: S12/S22 = 1

HA: S12/S22 > 1

This is distributed as an F distribution with Fn1-1,n2-1

So we can then look for the probability that the Fn1-1,n2-1 takes on a value of S12/S22

Let S1 be the prior standard deviation and S2 be the new standard deviation

n1 = 8, n2=6

S1 = 2.459, S2 = 0.717

The value of S12/S22 from the data is 11.785

The probability that the F7,5 takes on the value of 11.785 is then calculated as 0.992

. (f cdf (11.785,7,5))

Thus, the probability that the variance of the new algorithm is lower is 0.992.