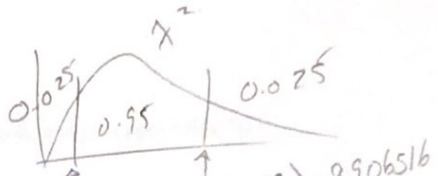
Example 8: The following data are the daily rates of return on a certain stock.

-1.8, +1.4, -3.4, +4.8, +3.3, -0.1, +2.9, -1.1, +3.1, -1.4, +2.1, -0.7, +0.8, -2.7, +0.6, -0.6, -1.8, +1.2, -0.5, -1.1

Find a 95% confidence interval for σ, the standard deviation in the daily return of this particular stock.

$n = 20$

$s \cong 2.180415\,2187865$



$$\frac{(n-1)s^2}{\chi^2_{0.975,19}} < \sigma^2 < \frac{(n-1)s^2}{\chi^2_{0.025,19}}$$

qchisq(0.025, 19) = 8.906516

qchisq(0.975, 19) = 32.85233

$$\frac{19(2.18)^2}{32.85233} < \sigma^2 < \frac{19(2.18)^2}{8.906516}$$

$\sigma^2 \Rightarrow [2.749577, 10.142012]$

$\sigma \Rightarrow [1.658185, 3.184653]$

Based on this sample we are 95% confident

$\sigma \Rightarrow [1.658, 3.184]$.

$\sigma^2 \Rightarrow [2.750, 10.142012]$.

$\mu \Rightarrow [-0.770, 1.2705]$