Name:

Quiz 2, Attempt 1

Find a confidence interval for the variance of a normal population based on a random sample of size 100, in which the outcome of the sample mean was recorded to be 1.6, and the outcome of the sample variance was recorded to be 7.3.

$$.9 = P\left(\chi^2_{.05}(99) < \frac{99\,S^2}{\sigma^2} < \chi^2_{0.95}(99) \right)$$

$$= P\left(\frac{1}{\chi^2_{0.95}(99)} < \frac{\sigma^2}{99\,S^2} < \frac{1}{\chi^2_{0.05}(99)} \right)$$

$$= P\left(\frac{99\,S^2}{\chi^2_{0.95}(99)} < \sigma^2 < \frac{99\,S^2}{\chi^2_{0.05}(99)} \right)$$

Thus a 90% CI for σ^2 is:

$$\left(\frac{99(7.3)}{\chi^2_{0.95}(99)} , \frac{99(7.3)}{\chi^2_{0.05}(99)} \right)$$