

Question One [3 marks] A manufacturer produces piston rings for an automobile engine. It is known that ring diameter is normally distributed with $\sigma = 0.001$ millimeters. A random sample of 15 rings has a mean diameter of $\bar{x} = 74.056$ millimeters.

- Construct a 99% two-sided confidence interval on the mean piston ring diameter.
- Construct a 99% lower confidence bound on the mean piston ring diameter. Compare the lower bound of this confidence interval with the one in part (a).

Variance Known.

17.9



Question Three [2 marks] A random sample has been taken from a normal distribution. Output from a software package follows:

Variable	N	Mean	SE Mean	StDev	Variance	Sum
x	10	20.9402	1.605	?	?	251.848

- Fill in the missing quantities.
- Find a 95% CI on the population mean.

Question Four [3 marks] A synthetic fiber used in manufacturing carpet has tensile strength that is normally distributed with mean 75.5 psi and standard deviation 3.5 psi. Find the probability that a random sample of $n = 6$ fiber specimens will have sample mean tensile strength that exceeds 75.75 psi.