MS Module 2 Confidence intervals (overview)

(The attached PDF file has better formatting.)

Reading: §8.1 Basic properties of confidence intervals

Confidence intervals are used throughout the textbook; this module covers the qualitative aspects and basic arithmetic. Confidence intervals may be lower-tailed, upper-tailed, or two-tailed; know the three types.

Problems using other distributions are discussed in the textbook, but the arithmetic is not usually possible for written examinations.

The final exam asks several types of questions in later modules:

● Given α (the probability of a Type I error), compute the bounds of the confidence interval.
● Given α and the true value of the statistic, compute β (the probability of a Type II error).
● Given α and β, and the true value of the statistic, compute the needed number of observations.

Reading: §8.2 Large-Sample Confidence Intervals for a Population Mean and Proportion

For large samples, we use the central limit theorem.

● Confidence intervals for the mean use the sample estimate of the standard deviation.
● Confidence intervals for proportions use the sample estimate of p to derive the standard deviation.

Some problems give the width for the confidence interval and derive the needed sample size. The problem may ask for a minimum sample size (appropriate for p = 50%) or give a lower bound or upper bound for p.

The final exam does not test mathematical proofs. Know when to use the central limit theorem, not how to prove it.