



QUESTION WORKBOOK

Estimators, standard error and confidence intervals

Further Statistics 2 · Year FM

6 questions · 20 marks

NAVY SCREEN EDITION

SECTION A · Warm-up

A1 Define an unbiased estimator, and name one unbiased estimator of a population variance. [2]

A2 A sample of 36 from a normal population with $\sigma = 12$ has mean 48. Find a 95% confidence interval for the population mean. [3]

SECTION B · Standard

B1 For the same sample, find a 99% interval and compare the two. [4]

- B2** How large a sample from the same population is needed for a 95% confidence interval of total width at most 4? [4]

- B3** From a sample of two independent readings, compare the estimators $(X_1 + X_2)/2$ and $(X_1 + 2X_2)/3$ of the population mean. [3]

SECTION C · Stretch

- C1** A student says a 95% confidence interval has a 95% probability of containing the population mean. Explain what is wrong and give the correct interpretation. [4]