



QUESTION WORKBOOK

Confidence intervals and tests with the t-distribution

Further Statistics 2 · Year FM

6 questions · 20 marks

PRINT EDITION

SECTION A · Warm-up

A1 State when the t-distribution is used in place of the normal, and how the two differ. [2]

A2 A sample of 16 has mean 52.5 and $s = 6$. Test at 5% in one tail whether the population mean exceeds 50, given a critical value of 1.753. [3]

SECTION B · Standard

B1 For the same sample, find a 95% confidence interval for the mean, given a t value of 2.131, and check it against the test. [4]

- B2** Eight subjects are measured before and after a treatment. The differences are 2, 5, -1, 3, 4, 0, 2, 1. Test at 5% in one tail whether the treatment raises the measurement, given a critical value of 1.895. [4]

- B3** Explain why the paired test is preferred to an unpaired one when the data come in natural pairs. [3]

SECTION C · Stretch

- C1** Sample 1: $n = 6$, mean 18.2, $s = 2.4$. Sample 2: $n = 9$, mean 15.8, $s = 3.1$. Assuming equal variances, test at 5% in two tails whether the means differ, given a critical value of 2.160. [4]