



QUESTION WORKBOOK

Least squares regression and residuals

Further Statistics 2 · Year FM

6 questions · 20 marks

PRINT EDITION

SECTION A · Warm-up

- A1** Define a residual, and state the quantity the least squares line makes as small as possible. [2]

- A2** For the points $(2, 5)$, $(4, 9)$, $(6, 10)$, $(8, 14)$, $(10, 17)$, find the regression line of y on x . [3]

SECTION B · Standard

- B1** For the same data, find the five residuals and the residual sum of squares, checking the total two ways. [4]

- B2** The data give y as a test score against x hours of practice. Interpret both coefficients, predict the score for 7 hours, and say why a prediction for 20 hours would be unwise. [4]

- B3** Describe what a plot of residuals against x should look like if a straight-line model is appropriate, and what two patterns would argue against it. [3]

SECTION C · Stretch

- C1** The last point is misrecorded as $(10, 30)$ instead of $(10, 17)$. Recalculate the regression line and comment on the effect. [4]