



---

QUESTION WORKBOOK

# Correlation coefficients: product moment and Spearman

Further Statistics 2 · Year FM

6 questions · 22 marks

PRINT EDITION

**SECTION A** · Warm-up

- A1** State what the product moment correlation coefficient measures and the range of values it can take. [2]

---

---

- A2** A data set gives  $S_{xx} = 40$ ,  $S_{xy} = 58$  and  $S_{yy} = 86$ . Find  $r$  and interpret it. [3]

**SECTION B** · Standard

- B1** Each  $x$  value is coded as  $u = (x - 20)/5$  and each  $y$  as  $v = (y - 100)/10$ . Explain the effect on  $r$ , and on the gradient of the regression line of  $y$  on  $x$ . [4]

- B2** Two coaches rank seven players. Coach A gives 1 to 7 in order; coach B gives 1, 3, 2, 5, 4, 7, 6. Calculate Spearman's rank correlation coefficient. [4]

- B3** Six items are ranked, and two of them tie for third place. Explain how the ranks are assigned, and calculate  $r_s$  if the resulting  $\sum d^2$  is 8. [3]

### SECTION C · Stretch

- C1** A colony is counted at six equally spaced times. The counts, in order, are 2, 3, 5, 9, 17 and 33, at times 1, 2, 3, 4, 5 and 6. Calculate the product moment correlation coefficient and Spearman's rank correlation coefficient, and explain why they differ so much. [6]