InkMaths

QUESTION WORKBOOK

Goodness-of-fit tests

Further Statistics 1 · Year FM

6 questions · 20 marks

PRINT EDITION

inkmaths.co.uk

SECTION A · Warm-up

A1 Write down the chi-squared goodness-of-fit statistic, and explain why each squared difference is divided by the expected frequency. [2]

A2 A spinner with five equal sectors is spun 100 times, giving 15, 22, 18, 25, 20. Compute the chi-squared statistic. [3]

SECTION B · Standard

B1 For that spinner test, state the degrees of freedom and the conclusion at the 5% level, given a critical value of 9.488. [3]

B2 A Poisson model is fitted to 60 observations with frequencies 12, 18, 15, 9, 6 for the values 0, 1, 2, 3, 4. Estimate λ from the data and state the degrees of freedom for the test. [4]

B3 Explain the rule for pooling classes, and its effect on the degrees of freedom. [4]

SECTION C · Stretch

C1 Two goodness-of-fit tests use the same data and the same number of classes. One specifies the model's parameter in advance; the other estimates it from the data. Explain which has more degrees of freedom, and why the estimated version tends to give a smaller statistic. [4]