InkMaths

QUESTION WORKBOOK

Geometric and negative binomial distributions

Further Statistics 1 · Year FM

6 questions · 20 marks

PRINT EDITION

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SECTION A · Warm-up

A1 State how the geometric distribution differs from the binomial in what it counts. [2]

A2 X follows a geometric distribution with $p = 0.3$. Find $P(X = 4)$ and the mean. [3]

SECTION B · Standard

B1 For the same distribution, find $P(X \geq 5)$ and explain why no summation is required. [3]

B2 A component passes inspection with probability 0.25. Find the probability that the second pass occurs on the sixth inspection, and the mean number of inspections needed for two passes. [4]

B3 Explain why the combination in the negative binomial formula is ${}^{x-1}C_{r-1}$ rather than ${}^{x}C_{r}$. [4]

SECTION C · Stretch

C1 Show that the negative binomial with r = 1 reduces to the geometric distribution, in probability, mean and variance. [4]