



QUESTION WORKBOOK

Geometric and negative binomial distributions

Further Statistics 1 · Year FM

6 questions · 20 marks

NAVY SCREEN EDITION

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 xC_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]