



QUESTION WORKBOOK

The binomial distribution

Statistics · Year 12–13

6 questions · 20 marks

PRINT EDITION

SECTION A · Warm-up

- A1** State the conditions under which a count X can be modelled by a binomial distribution $B(n, p)$. [2]

- A2** $X \sim B(8, 0.25)$. Find $P(X = 2)$ to 3 significant figures. [3]

SECTION B · Standard

- B1** $X \sim B(12, 0.2)$. Find $P(X = 3)$ and $P(X = 0)$, each to 3 significant figures. [4]

- B2** $X \sim B(20, 0.15)$. Write $P(X \geq 4)$ in a form a calculator's cumulative function accepts. [3]

- B3** A machine produces faulty parts with probability 0.1, independently. In a box of 10 parts, find the probability of at most one faulty part, to 3 significant figures. [4]

SECTION C · Stretch

- C1** Twenty students in the same class are each asked whether they attended a party at the weekend, and X counts the yes answers. Explain why $B(20, p)$ may be a poor model, and describe the sort of situation the binomial does fit. [4]