InkMaths

QUESTION WORKBOOK

Continuous random variables: density and distribution functions

Further Statistics 2 · Year FM

6 questions · 20 marks

PRINT EDITION

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SECTION A · Warm-up

A1 Explain why $P(X = 1.5) = 0$ for a continuous random variable, and what follows for strict and non-strict inequalities. [2]

A2 $f(x) = k(4 - x^2)$ for $0 \le x \le 2$ and zero elsewhere. Find k. [3]

SECTION B · Standard

B1 For that density, find $F(x)$ on the interval and hence $P(X < 1)$. [4]

B2 $f(x) = x/8$ for $0 \le x \le 4$. Find $F(x)$, the median and the lower quartile. [4]

B3 A variable has $F(x) = x^2/16$ on $0 \le x \le 4$. Find its density and $P(1 < X < 3)$. [3]

SECTION C · Stretch

C1 A triangular density has $f(x) = x$ for $0 \le x < 1$ and $f(x) = 2 - x$ for $1 \le x \le 2$. Verify it is valid, find $F(x)$ in full, and evaluate $P(X < 1.5)$. [4]