



SMIYL GCEALevelMaths9709

CANDIDATE
NAME

CENTRE
NUMBER

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MATHEMATICS

Paper 6 Guess Paper

9709 Stats 2

October/November 2024

1 hour and 15 minutes

You must answer on the question paper
You will need: List of formulae (MF19)

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number, and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- If additional space is needed, you should use the lined page at the end of this booklet; the question number or numbers must be clearly shown.
- You should use a calculator where appropriate.
- You must show all necessary working clearly; no marks will be given for unsupported answers from a calculator.
- Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place for angles in degrees, unless a different level of accuracy is specified in the question.

INFORMATION

- The total mark for this paper is 50
- The number of marks for each question or part question is shown in brackets

This document has 11 pages.

1. The number of customer support calls that a company receives during an 7-hour working day is modelled by the random variable X with distribution $Po(32.2)$.

(a) State **two** assumptions that are required for the Poisson model to be valid in this context. [2]

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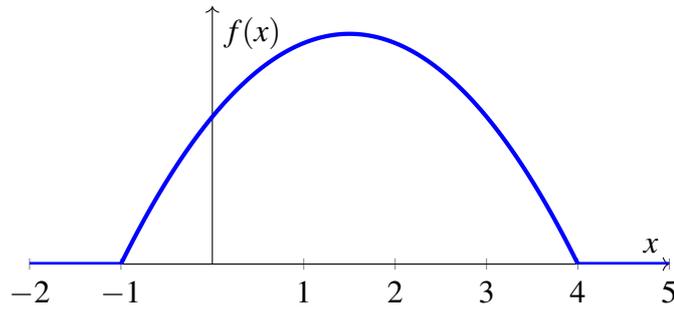
(b) i. Find the probability that the number of customer support calls received in a randomly chosen 2-hour period is between 4 and 6 inclusive. [3]

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ii. Find the probability that, in two randomly chosen 1-hour periods, exactly 1 customer support call will be received in one of the 1-hour periods, and at least 2 customer support calls will be received in the other 1-hour period. [4]

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6.



The diagram shows the graph of the probability density function, f , of a random variable X which takes the values between -1 and 4 only.

- (a) Given that the graph is symmetrical about the line $x = 1.5$ and that $P(X < 2) = p$, find $P(1 < X < 2)$ in terms of p . [2]

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- (b) It is now given that the probability density function shown in the diagram is given by

$$f(x) = \begin{cases} a - b(x^2 - 3x) & -1 \leq x \leq 4, \\ 0 & \text{otherwise} \end{cases}$$

where a and b are positive constants.

- i. Show that $30a + 5b = 6$. [3]

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- ii. By substituting a suitable value of x into $f(x)$, find another equation relating a to b and hence determine the values of a and b . [3]

