

Cambridge International AS & A Level

CANDIDATE NAME						
CENTRE NUMBER				CANDIDATE IUMBER		

MATHEMATICS 9709/06

Paper 6 Probability & Statistics 2

For examination from 2020

SPECIMEN PAPER

1 hour 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 **14** pages. Blank pages are indicated.

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ı)	Calculate a 99% confidence interval for the population mean length.
))	
))	
))	Write down the probability that the whole of a 99% confidence interval will lie below the population mean.
))	

76 students.	[3

(a)	Find the probability of exactly 4 calls in an 8-minute period.	[
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(b)	Find the probability of at least 3 calls in a 3-minute period.	
(b)	Find the probability of at least 3 calls in a 3-minute period.	
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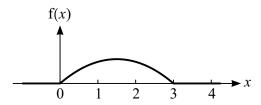
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The number of calls received at a large call centre has a Poisson distribution with mean 41 calls per 5-minute period.

5-minute period is between 41 and 5	to find the probability that the number of 19 inclusive.	[5]

	Find the probability that the total of the lifetimes of five rar than 5200 hours.	ndomly chosen Longlive bulbs
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of a randomly chosen Longlive bulb.	[6]



The diagram shows the graph of the probability density function, f, of a random variable X, where

$$f(x) = \begin{cases} \frac{2}{9}(3x - x^2) & 0 \le x \le 3, \\ 0 & \text{otherwise.} \end{cases}$$

tate the value of $E(X)$ and find $Var(X)$.	[4

(b)	State the value of $P(1.5 \le X \le 4)$.	[1
(c)	Given that $P(1 \le X \le 2) = \frac{13}{27}$, find $P(X > 2)$.	[2

At a certain hospital it was found that the probability that a patient did not arrive for an appointment 6 was 0.2. The hospital carries out some publicity in the hope that this probability will be reduced. They wish to test whether the publicity has worked. A random sample of 30 appointments is selected and the number of patients that do not arrive is noted. This figure is used to carry out a test at the 5% significance level. (a) Explain why the test is one-tailed and state suitable null and alternative hypotheses. [2] Use a binomial distribution to find the critical region, and find the probability of a Type I error. [5]

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In fact 3 patients out of the 30 do not arrive. State the conclusion of the test, explaining your answer.	
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$\Sigma x = 430$	$\Sigma x^2 = 1290$
Carry out the test at the 10% significance level.	[7

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Additional page

If you use the following lined page to complete the answer(s) to any question(s), the question number(s) must be clearly shown.						
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