

Cambridge International Examinations

Cambridge International Advanced Level

CANDIDATE NAME											
CENTRE NUMBER						CANDIDA ^T NUMBER	TE [
MATHEMATICS										97	09/71
Paper 7 Probabil	lity & Sta	atistics 2	(S2)						May	/June	2018
								1	hour	15 m i	nutes
Candidates answ	er on the	e Quest	ion Pa	per.							
Additional Materia	als:	List of F	ormu	lae (Mi	- 9)						

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name in the spaces at the top of this page.

Write in dark blue or black pen.

You may use an HB pencil for any diagrams or graphs.

Do not use staples, paper clips, glue or correction fluid.

DO NOT WRITE IN ANY BARCODES.

Answer **all** the questions in the space provided. If additional space is required, you should use the lined page at the end of this booklet. The question number(s) must be clearly shown.

Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place in the case of angles in degrees, unless a different level of accuracy is specified in the question.

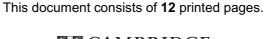
The use of an electronic calculator is expected, where appropriate.

You are reminded of the need for clear presentation in your answers.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [] at the end of each question or part question.

The total number of marks for this paper is 50.





A random sample of 75 values of a variable X gave the following results.

1

	n = 75	$\Sigma x = 153.2$	$\Sigma x^2 = 340.24$	
Find unbiased esting	mates for the po	opulation mean and v	variance of X .	[3
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2

A six-sided die is suspected of bias. The die is thrown 100 times and it is found that the score is 2 on

Fino	d an approximate 94% confidence interval for p .	[3
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Use	your answer to part (i) to comment on whether the die may be biased.	[1

300-day period.					[
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4

The volume, in millilitres, of a small cup of coffee has the distribution N(103.4, 10.2). The volume

(i)	Find the mean and standard deviation of the volume of a large cup of coffee.
(ii)	Find the probability that the total volume of a randomly chosen small cup of coffee and a rando chosen large cup of coffee is greater than 250 ml.

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6	The time, in minutes, taken by people to complete a test is modelled by the continuous random variable
	X with probability density function given by

$$f(x) = \begin{cases} \frac{k}{x^2} & 5 \le x \le 10, \\ 0 & \text{otherwise,} \end{cases}$$

where k is a constant.

(1)	Show that $k = 10$.	[3]
(ii)	Show that $E(X) = 10 \ln 2$.	[2]

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7

The number of absences by girls from a certain class on any day is modelled by a random variable with

(i)	Find the probability that, during a randomly chosen 2-day period, the total number of abs is less than 3.
(**)	
(ii)	Find the probability that, during a randomly chosen 5-day period, the number of absence boys is more than 3.
(ii)	boys is more than 3.
(ii)	boys is more than 3.
(ii)	boys is more than 3.
(ii)	boys is more than 3.
(ii)	boys is more than 3.
(ii)	boys is more than 3.
(ii)	boys is more than 3.

(iii) The teacher claims that, during the football season, there are more absences by boys than usual.

(a)	State what is meant by a Type I error in this context.
(b)	State appropriate null and alternative hypotheses and find the probability of a Type I e
(c)	In fact there were 4 absences by boys during this period. Test the teacher's claim at the significance level.

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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