

Cambridge International AS & A Level

M1-9-7-	CANDIDATE NAME		
	CENTRE NUMBER		CANDIDATE NUMBER
	MATHEMATIC	S	9709/51
0	Paper 5 Probab	ility & Statistics 1	October/November 2024
0 4			1 hour 15 minutes
	You must answe	er on the question paper.	
	Vou will pood:	List of formulas (ME10)	

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.

This document has 16 pages. Any blank pages are indicated.

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 [].

[Turn over



a) I	Find $P(X < 8)$.	[2]
•		
•		
b) ł	Find the probability that Nicola obtains a 6 for the second time on her 8th throw.	[2]
•		
•		
•		
•		



DO NOT WRITE IN THIS MARGIN

DO NOT WRITE IN THIS MARGIN

000080000003	*
000000000000000000000000000000000000000	

*

	3
The a po	random variable X takes the values $-2, -1, 0, 2, 3$. It is given that $P(X = x) = k(x^2 + 2)$, where k is sitive constant.
(a)	Draw up the probability distribution table for X , giving the probabilities as numerical fractions. [3]
(b)	Find the value of $Var(X)$. [3]
	a po (a)





3 The time taken, in minutes, to walk to school was recorded for 200 pupils at a certain school. These times are summarised in the following table.

4

Time taken (<i>t</i> minutes)	<i>t</i> ≤ 15	<i>t</i> ≤ 25	<i>t</i> ≤ 30	<i>t</i> ≤ 40	<i>t</i> ≤ 50	<i>t</i> ≤ 70
Cumulative frequency	18	46	88	140	176	200

(a) Draw a cumulative frequency graph to illustrate the data.

	171		Ť	î î	1.	1	†	 	tr	t	t	+	t	Ť	Ť	1	1.	t	t	t	t	1	1	†	Ľ	Ť	Ť	t	÷	t	t	Ť	Ť	t	t	t	t	t	Ť	11	t	t	1	Ť	Ť	tr	1	1	1	Ť	i	 	1	1	Ť	Ť	11	T	T	ΎΠ	1	1			1	Ť	
			Ц.			Į.,	Į	 	ļ	1	1.		Ι.	Ц.	Ι.	1.	Į.,	Į.,	Į	μ.	Į	1	Į.,	ļ		Π.	μ.	Į.,	1.	Ц.		4	μ.	1	1.	Ц.	Π.	μ.	1.	1	1	1.		Π.	Į.	μ.	1	ļ.,				 			1	1											
			÷			÷		 	÷	÷	÷	÷	+-	÷	÷	÷	÷	÷	÷	+	+	÷	<u>+</u>	÷	÷	÷	÷	÷	÷	+-	+-	+-	÷	÷	÷	÷	+-	+-	+-	+	÷	÷	÷	÷	÷	+	÷	÷	÷	÷		 			-+	÷	÷		+		+	-+			÷		
11	1		Ť	11	11	t	1		÷	tr	t	t	t	Ť	Ť	t	t	t	t	t	t	t	i	i	t	Ť	Ť	t	÷	Ť	Ť	Ť	Ť	t	Ť	Ť	Ť	t	Ť	t	t	Ť	Ť	Ť	Ť	t	t	t	t	t			-	Ť	÷	Ť	÷	1	÷	11		÷	÷	Ť	÷	Ť	
			Ţ.				ļ	 	Į	Į.,	1.		ļ.,	Ļ	Į.	Į.,	Į.,	Į.,	ļ	Ļ.	Į	Į.,	Į.,	ļ	1.	Į.	Į.	Į.	1	4.	Ι.	Ļ	Į.	Į.,	1.	1.	ļ.,	Ļ	Ļ.	Į.,	Į.,	1.	ļ.,	Į.	Į.	Į.,	Į.,	Į.,	ļ	ļ	Į	 		1	ų	1			Į.,	Ļ.,							
			÷	÷÷		ŀ	÷	 	÷	ł÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷-	ł	÷	÷	÷	÷	÷	÷	÷	÷	- <u>+</u> -	-÷-	÷	÷	÷	÷	- -	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷		 		}	÷	÷				÷		÷			÷	÷	
	1-1		÷	ή÷	-1	÷	t	 	ţ	÷	÷	÷	÷	÷	÷	÷	÷	t-	t-	÷	÷	÷	ţ	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	t	÷	÷	÷		 		÷	÷	÷	÷	÷	÷	1-1		÷	÷	÷	÷	÷	
			1			1							1	1	1	1	1			1		11	1		1	1	1	1		1	1	1	1			1		1	1	1	1			1	1	1	1	1				 			1							1					
	<u> </u>		÷-	+-+		ļ	ł	 	Ļ	Į	÷	÷	+-	4-	÷.	÷	÷	į	ļ	Ļ.,	<u> </u>	<u></u>	ł	ļ	ļ.,	÷-	÷.	÷	4-	- -	- -	4-	÷-	÷	4	- <u>+</u> -	÷-	+-	4	÷	ł	÷	÷	÷	÷.	÷	ł	÷	÷	ļ	Ļ	 			-4				- <u> </u>	÷							
			÷	÷÷		ŀ	ł	 ·	÷	÷	÷	÷	÷-	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	 		÷	÷	÷	÷		÷	÷	÷	÷	÷	÷	÷	÷	
11	1		İ	11	11	Ľ	1		Ì.	Í.	T	1	Ľ	İ.	Î.	11	11	Ľ	Ľ	Ì.	İ.	11	tt	1	Ľ	Ì	İ.	£	1	1	t	Ì	Î	Í.	T	t	1	İ.	Ť.	11	Ľ	t	1	Ì	Î.	Ĺ	t	1	Ľ	Ì.	Ì.		1	1	Î	Ť	11	1	Ľ	1 d	T.	Ť	1	T	T)	Ľ	
	I		Ц.		Ц.,	1	1		ļ	1	1.		1.	1.	1.	1.	1	Į.,	Į	Į.,	Į.,	1	Į.,	I	1.	1.	1.	1.	1	Ц.	Ц.	4.	1.	1	1.		Ц.	1.	1.	1	1	1	ļ.,	1.	1.	1	Į.,	1		L.,	L				1	1			1.							1	
			÷	÷-+		į	÷	 	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	- <u>+</u> -	÷-	÷	÷	÷	÷	÷	÷	+-	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷		 			-+	÷	÷		÷	÷	+	÷		÷	÷		
	1		÷	tt	- †	÷	t	 	÷	÷	t	t	t	t	t	t	t	tr	t	t	+	t	†	÷	t	÷	÷	t	÷	÷	÷	t	t	÷	t	÷	t	t	÷	t	t	t	t	t	t	tr	†	÷	t	÷	÷	 			÷	÷	÷		+-	†		÷	÷	÷	÷	-+	
			Π.	11	1	1	Į	 	Į	1	1.		Ι.	Ţ.	Į.	1.	1	Ι	<u>[</u>	ξ.,		1	1			χ.	χ.	Į.	1	4.	Π.	Π.	Į.	1.	1.	Ц.		Ţ.	1.	1.	1.	1.		χ.	Į.	11	1	Į.,		(Į	 	,	1	11											,	
	<u> </u>		÷-	÷	. <u>.</u>	į	<u>+</u>	 	ļ	į	į.	÷	ļ.	÷	į.	ļ.,	į	į.	į	Ļ.	į.	į	į	į	ļ.	÷.	÷.	į.	÷	- <u> </u> -	+-	÷	÷.	į.,	÷	÷-	÷.	÷	÷	į.,	ļ.,	÷	Ļ.	÷	÷.	į	į	ł	÷	į	ļ	 			4	÷	÷			ļ		-÷				4	
			÷	+ +	÷	÷	÷	 	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	 	+	÷	÷	÷	 		-+	÷	÷	÷	÷	+		÷	÷		÷	÷	+	
		1	Ť	t t	Ť	t			t	t	t	t	t	t	t	t	t	t	t	t	t	İ.	İ.	i.	t	Ť	Ť	t	Ť.	Ť	Ť	Ť	t	t	t	Ť	t	t	Ť	t	t	t	Ť	t	t	t	İ.	t	t	t	İ.			Ť	Ť	Ť	Ť	÷	t	t i	Ť	Ť	T	Ť	Ť	Ť	
			Ţ.			Į	Į	 	Į	Į	1.		ļ.,	Ţ.	Į.	Į.,	ļ.,	Į	ļ	μ.	Į	Į.,	Į	ļ	1.	Π.	μ.	ξ.,	1	4.	Π.	Ļ	Į.	Į.,	1.	Ц.	Π.	Ţ.	Į.	Į.,	Į.,	1.	ļ.,	Į.	Į.	Į.	Į	ļ.,		ļ	Į	 			1	1				ļ.,							
			÷	÷-+		ŀ	÷	 	÷	÷	÷	÷	ł-	÷	÷	÷	÷	÷	<u>-</u>	÷	÷	÷	<u> </u>	÷	ŀ	÷	÷	÷	÷	-+-	+-	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	<u></u>	÷	÷	÷	÷	 		}	÷	÷			- - ·	÷	+					÷	
	1-1		Ť	î î	11	t	11	 	ţ	t	t	t	T	Ť	Ť	T	11	t	T	Ť	Ť	1	1	<u>†</u>	t	Ť	Ť	Ť	Ť	Ť	1	Ť	Ť	Ť	Ť	T	T	Ť	Ť	t	t	t	T	Ť	Ť	1	1	1	t	1	1	 			Ť	1	Ť	1	T	1		1		1	1	1	• • •
			1			1	1			1	1.		1.	1	1	1.	1	Ι	Į		1	1	1		1	Ξ.	1.	1.	1	1	1	1	1.	1.	1	1	1.	1.	1	1.	1			Ξ.	1	1	1	1				 				1			1.								
	÷		÷	÷-+		į	÷	 	÷	÷	÷	÷	+-	÷-	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	-÷-	÷-	+-	÷	÷	÷	÷-	÷-	÷-	÷	÷	÷	÷	÷	÷	÷.	÷-	÷	÷	÷	÷	÷	 				÷	-+-		÷	÷		-+	+	÷-	-+		•••
- i- i	1 1		Ť	t t	11	t	†	 	÷	tr	t	t	t	÷	Ť	t	t	tr	t	÷	÷	tr	<u>†</u>	†	t	Ť	Ť	t	÷	÷	÷	Ť	Ť	÷	t	÷	÷	t	÷	t	t	t	t	Ť	÷	÷	t	t	t	t	÷	 		÷	Ŷ	÷	÷	1	t	\dot{t}	÷	÷	÷	÷ţ	÷	TŶ.	••••
	11		Ĩ.	11	30	1.	111		<u>.</u>	11	1.	1.	1	Ì.	Î.	11	11	1.	Ľ.	11	<u>)</u>	11	11	1	1	11	1	11	1	1	11	Ľ	Í.	11	1	1	1.	Ľ	Ĵ.,	<u>)</u> []	11	1	1	11	Î.	<u>)</u> []	11	1.	1	<u>.</u>	<u>.</u>			R	Ĵ.	3			1.		1	. 1		1	11	Ľ	
	<u> </u>		÷-			ļ	ļ	 	ļ	ļ	4	. <u>.</u>	<u> </u>	÷-	÷.	4	ļ	ļ	ļ	<u> </u>	<u> </u>	ļ	ļ	ļ	ļ.,	Ļ.	.	.	4-	4-			4.	Ļ.,	4.	4.	. .	+-	÷	<u>+</u>	ļ	ļ	Ļ.,	÷.	Ļ.	<u> </u>	ļ	ļ		ļ		 				4			. <u> </u>	Ļ							
			÷	+-+		÷	<u>+</u>	 	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	+	†	!	÷	÷	÷	÷	÷	÷	+-	+-	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	<u>+</u>	÷	+	÷		 			÷	÷	÷		+	+	+	÷	+	÷	÷		• • •
	11	†-	Ť	t t	11	t	tri		†	t	t	Ť	Ť	Ť	Ť	Ť	t	tr	t	Ť	Ť	i.	i	t	Ť.	Ť	Ť	Ť	Ť	Ť	Ť	Ť	Ť	Ť	Ť	Ť	Ť	Ť	Ť	Ť	t	Ť	Ť	Ť	Ť	Ť	i	Ť	Ť	t	÷		1	Ť	Ť	Ť	Ť	1	Ť	† T	Ť	Ť		Ť	Ť	1	
			Π.		Q.,	1.	1		Į.,	μ.	1.		Į.,	Į.	Į.	Į.,	1.	μ.	Ç.,	ξ.,	Į	1.	1	Į	ί.	χ.	χ.	Į.	1	4	1	Ţ.	Į.	Į.,	1.	1.	.	Į.	Į.,	Į.,	1.	1	ļ.,	Ţ.	Į.	Į.	1.	1	ļ.,	(II.	Į	 			Q	Q.	4		1.							14	
	{ {		÷	÷-+		ł	÷	 	÷	ł	÷	÷	+-	÷	÷	÷	÷	÷	÷	÷-	÷	ł	ł	÷	÷	÷	÷	÷	÷	-÷-	-÷-	÷	÷	÷.,	÷	-÷-	÷-	÷	÷	÷	÷	÷	÷	÷	÷	÷	ł	÷	÷	÷	÷	 			÷	÷	÷		÷	÷{		-÷			÷	÷	
	<u>.</u>	÷	÷	tt		÷	†	 	÷	tr	t	÷	÷	÷	÷	÷	÷	t	t	÷	÷	†	†	÷	÷	÷	÷	t	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	tr	†	÷	÷	÷	÷	 		÷	÷	÷	÷	÷	÷	1-1	†	÷	÷	÷	÷	÷	••••
			1		1	1	1			1			L	1	1	1	1	1				1	11	1		1	1	1		1	1	1	1	1		1	1	1	1	1	1			1	Ī.	1	1	1							1	1			1					1			
	¦		÷-	÷-+		į	÷	 	Ļ	Į	÷	÷	+-	÷-	÷.		÷	÷	ļ	Ļ.,	<u>.</u>	ł	į	÷	ļ.,	÷	÷.		4-	-+-	-+-	4-	÷-		4-	-÷-	- -	÷-	÷		į	÷	÷	÷-	Ļ.	÷	ł	÷	÷	ļ	ļ	 			-+-			·	- <u>+</u>	÷							
	<u></u>		÷	÷÷		ŀ	÷	 	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	ł-	÷	÷	÷	ŀ	÷	÷	÷	÷	-†-		÷	÷	÷	÷	÷÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	 			÷	÷	÷		-†	ł		÷	+	÷	-÷	÷	• • •
			Ť	11	11	Ľ	10		Î	Í.	T	1	T	Ť	Î	11	11	Ľ	Ľ	Ť	Ť	11	11	1	Ľ	Ì	Î	1	T	1	1	T	Î	T	T	1	1	Ľ	Ť	11	1T	1	T	Ì	Î	Í.	11	1	1	1	<u>.</u>			1	Ť	1	11	1	1		1	1		T	11	1	
			1					 		1			1.	1	1	ļ.,	ļ	ļ	ļ	ļ.,	ļ	Į.,	Į.,			1.	1.	Į.		4	4	4.	1.	1	1	1	4.	1.	1	1.	Į.,		ļ.,	1	Į.	ļ.,	ļ					 				4	4		4.							4	
	÷		÷	÷÷	-÷	÷	ł	 	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	 			÷	÷	÷÷		÷	+	+	÷	÷	÷	÷	÷	• • •
	1	†-	Ť	tt	- 1	÷	t	 	÷	÷	t	t	t	t	Ť	t	t	tr	t	t	t	tr	†	†	t	Ť	Ť	t	÷	÷	t	$^{+}$	t	t	t	t	t	t	Ť	t	t	t	t	t	Ť	tr	1	†	t	t	÷	 		÷	ή	÷	÷	-1-	t	$^{+-}$	÷	÷	÷	÷	÷	Ť	• • •
.))			Π.	111	32	1	1		X	11	1.		Ι.	II.	Π.	Э.,	1	Ε.	C.,	Ι.	Ш.	11	1	I	Ľ	Ľ	Π.	11	1	11	Π.	Ľ	Π	3	Π.		Π.	II.	Н.	11	1.			Π.	Ľ	11	1					 	(Ц	3												
	<u> </u>		÷-	+-+		ļ	į	 	ļ	į	÷		+-	+-	Ļ.	÷	÷	į	į	÷	÷	į	į	į	ļ.	÷	÷	Ļ.	4-		- -	+-	÷-	÷	4.	- -	÷-	+-	+-	÷	į	÷	÷	÷-	÷.	-	ļ	÷	. <u>.</u>	÷	ļ	 				-			- 	ļ						-+	
			÷	+-+	÷	÷	<u>+</u>	 	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	t	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	<u>+</u>	+	÷	÷	÷	 		-+	÷	÷	÷	÷	+	÷	+	÷		÷	÷	÷	
	i i	Ť	Ť	tt	Ť	t			È	ÍT	t	t	t	İ	İ	İ	tr	tr	t	Ť	İ	İT	İ.	İ	t	Ť	İ	İ	Ť	İ.	Ť	Ť	İ	Ť	Ť	Ť	t	Ť	Ť	t	t	t	Ť	Ť	Ť	İT	i:-	t	Ť	È	İ.			Ť	Ť	Ť	Ť	Ť	Ť	t l	ij	Ť	Ť	Ť	Ť	Ĵ	
			Ţ	10	11	11	[]		<u>.</u>	Ľ	1.	1.	1	Ţ.	Į.	1.	1.	Π.	<u>[</u>]	ξ.,	Į.	11	11	Į		Ţ.	Į.	Į.	1	1	Τ.	Ţ	Ţ.	Į.	Ţ.	1.	1	Ţ	1	11	E	1.		Ţ.	Ţ	Į.	10	1	1.					11	11	Q.	1		1		11	Ŋ				I),	
	<u> </u>		÷	÷÷		ŀ	÷	 ·	÷	ł	÷	÷	+-	÷	÷	ł	÷	ł	<u>.</u>	÷-	÷	<u> </u>	ł	÷	ļ.	÷	÷	ł.	÷	-+-	- <u>+</u> -	÷	÷	÷	÷	- <u>+</u> -	+-	÷	+	÷	ł	÷	÷	÷	÷	ł	ł	÷	÷	÷	÷	 			÷	÷				÷						÷	
	i i	÷-	÷	÷÷÷	-+	÷	÷	 	÷	÷	÷	·+	÷-	+-	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷	÷·	÷	÷	÷	-÷-	-÷-		÷	÷	÷	-÷-	÷-	÷-	+	÷	÷	÷	÷	÷·	÷	÷	÷	÷	÷	÷	÷	 +				- 4-			. L	÷	4		+	÷-	÷	-+	

(b)	Use your graph to estimate the median and the interquartile range of the data.	[3]
		•••••
		•••••
		•••••
		•••••
		•••••
	817922	

[2]



5
Calculate an estimate for the mean value of the times taken by the 200 pupils to walk to sch

DO NOT WRITE IN THIS MARGIN

.. © UCLES 2024



9709/51/O/N/24

.....

[Turn over



4 Rahul has two bags, X and Y. Bag X contains 4 red marbles and 2 blue marbles. Bag Y contains 3 red marbles and 4 blue marbles. Rahul also has a coin which is biased so that the probability of obtaining a head when it is thrown is $\frac{1}{4}$.

6

Rahul throws the coin.

- If he obtains a head, he chooses at random a marble from bag *X*. He notes the colour and replaces the marble in bag *X*. He then chooses at random a second marble from bag *X*.
- If he obtains a tail, he chooses at random a marble from bag *Y*. He notes the colour and discards the marble. He then chooses at random a second marble from bag *Y*.
- (a) Find the probability that the two marbles that Rahul chooses are the same colour.

[3]



9709/51/O/N/24

marbles a	re blue.	hat the two	marbles th	at Rahul o	chooses ar	e both fror	n bag <i>Y</i> giv	en th
•••••				•••••				
								•••••
		••••••					••••••	
		•••••••••••••••						
	••••••					•••••		
•••••				•••••		•••••		
•••••								
•••••		•••••				•••••	•••••	
		••••••		•••••				
		•••••						
•••••		•••••					•••••	• • • • • • •
		•••••						
								•••••
		••••••						
	•••••		•••••			•••••		
•••••			•••••	•••••		•••••		







5 The weights of the green apples sold by a shop are normally distributed with mean 90 grams and standard deviation 8 grams.

8

(a) Find the probability that a randomly chosen green apple weighs between 83 grams and 95 grams.

[4]

.





(b) The shop also sells red apples. 60% of the red apples sold by the shop weigh more than 80 grams. 160 red apples are chosen at random from the shop.

9

Use a suitable approximation to find the probability that fewer than 105 of the chosen red apples weigh more than 80 grams. [5]

© UCLES 2024

驪



- The heights of the female students at Breven college are normally distributed:
- 90% of the female students have heights less than 182.7 cm. •
- 40% of the female students have heights less than 162.5 cm.
- (a) Find the mean and the standard deviation of the heights of the female students at Breven college.

10

24	9709/51/0	0/N/24	
•••••	 		
•••••	 		



DO NOT WRITE IN THIS MARGIN

DO NOT WRITE IN THIS MARGIN

DO NOT WRITE IN THIS MARGIN

DO NOT WRITE IN THIS MARGIN

[5]

* 0000800000011 *	

Ten female students are chosen at random from those at Breven college.

Find the probability that fewer than 8 of these 10 students have heights more than 162.5 cm



(a)	How many different arrangements are there of the 9 letters in the word INTELLECT in which	ch t
	two Ts are together?	
		•••••
		•••••
		•••••
		•••••
		• • • • • •
		•••••
		•••••
(b)	How many different arrangements are there of the 9 letters in the word INTELLECT in there is a T at each end and the two Es are not next to each other?	
(b)	How many different arrangements are there of the 9 letters in the word INTELLECT in there is a T at each end and the two Es are not next to each other?	
(b)	How many different arrangements are there of the 9 letters in the word INTELLECT in there is a T at each end and the two Es are not next to each other?	
(b)	How many different arrangements are there of the 9 letters in the word INTELLECT in there is a T at each end and the two Es are not next to each other?	
(b)	How many different arrangements are there of the 9 letters in the word INTELLECT in there is a T at each end and the two Es are not next to each other?	
(b)	How many different arrangements are there of the 9 letters in the word INTELLECT in there is a T at each end and the two Es are not next to each other?	
(b)	there is a T at each end and the two Es are not next to each other?	
(b)	there is a T at each end and the two Es are not next to each other?	
(b)	there is a T at each end and the two Es are not next to each other?	whi [
(b)	there is a T at each end and the two Es are not next to each other?	
(b)	there is a T at each end and the two Es are not next to each other?	
(b)	there is a T at each end and the two Es are not next to each other?	
(b)	there is a T at each end and the two Es are not next to each other?	
(b)	there is a T at each end and the two Es are not next to each other?	
(b)	there is a T at each end and the two Es are not next to each other?	
(b)	there is a T at each end and the two Es are not next to each other?	



* 0000800000013 *	

Four letters are selected at random from the 9 letters in the word INTELLECT.

Find the percentage of the possible selections which contain at least one E and exactly one T. [4]





Additional page

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

© UCLES 2024	9709/51/O/N/24



BLANK PAGE





BLANK PAGE

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge Assessment International Education Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cambridgeinternational.org after the live examination series.

Cambridge Assessment International Education is part of Cambridge Assessment. Cambridge Assessment is the brand name of the University of Cambridge Local Examinations Syndicate (UCLES), which is a department of the University of Cambridge.

© UCLES 2024



9709/51/O/N/24