

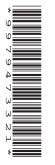
Thursday 22 June 2023 – Afternoon

A Level Further Mathematics A

Y544/01 Discrete Mathematics

Printed Answer Booklet

Time allowed: 1 hour 30 minutes



You must have: • Question Paper Y544/01 (inside this document)

- the Formulae Booklet for A Level Further
- Mathematics A
- · a scientific or graphical calculator



Please write clea	rly in black	k ink. Do n	ot writ	e in the barcodes.		
Centre number				Candidate number		
First name(s)						
Last name					 	

INSTRUCTIONS

- Use black ink. You can use an HB pencil, but only for graphs and diagrams.
- Write your answer to each question in the space provided in the Printed Answer Booklet. If you need extra space use the lined pages at the end of the Printed Answer Booklet. The question numbers must be clearly shown.
- Answer all the questions.
- · Where appropriate, your answer should be supported with working. Marks might be given for using a correct method, even if your answer is wrong.
- Give non-exact numerical answers correct to 3 significant figures unless a different degree of accuracy is specified in the question.
- The acceleration due to gravity is denoted by $gm s^{-2}$. When a numerical value is needed use g = 9.8 unless a different value is specified in the question.

INFORMATION

- The total mark for this paper is 75.
- The marks for each question are shown in brackets [].
- This document has 16 pages.

ADVICE

Read each question carefully before you start your answer.

1(a)&(b) Minimum project completion time: 1(c) Minimum project completion time:

2(a)	
2 (b)	
2(b)	
2(c)	
2(d)	

3 (a)								
C(u)	Р	x	у	z	S	t	RHS	
	1	-2	3	-1	0	0	0	
	0	5	-4	1	1	0	20	
	0	2	-1	0	0	1	6	
	P	x	у	Z.	S	t	RHS	
	P	r		7	C.	t	RHS	
		<i>x</i>	у	Z.	S		KII5	
3(b)								
	<i>P</i> =							
	x = y =	z =						
	s = t =							

3(d)							
If	needed for w	orking:					
If	needed for w	orking:	y	<i>Z.</i>	S	t	RHS
If			<i>y</i>	Z	S	t	RHS
If			<i>y</i>	<i>Z</i>	S	t	RHS
If			<i>y</i>	<i>Z</i>	S	t	RHS
If			<i>y</i>		S	t	RHS
If			y y	Z.	<i>S</i>		RHS
	P	<i>x</i>					

4 (a)	
4(b)	
4(c)	
4(0)	

4(d)	

DO NOT WRITE IN THIS SPACE

5(a)	Original list	3	24	8	1	4	20	30	18
	First pass								
	1								
	Garandaraa								
	Second pass								
5(b)(i)									
5(b)(ii)									
5(c)									

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5(d)	

6(a)	
6(b)	
	Total weight =
6(c)	
	Total weight =

6(d)(i)	
	Lower bound =
6(d)(ii)	
U(U)(II)	
	Upper bound =
6(e)	
0(0)	

7(a)(i)				Player 2		I
			А	В	С	
		Х	2	-3	-4	
	Player 1	Y	0	1	3	
		Ζ	-2	2	4	
	-					
	Play-safe strate	egy for pla	ayer 1 is			
	Play-safe strate	egy for pla	ayer 2 is			
7(a)(ii)						
7(b)						

7(c)	
7(d)	
7(u)	
	x = y = z =
	Value of the game to player $1 =$

ADDITIONAL ANSWER SPACE

If additional space is required, you should use the following lined page(s). The question number(s) must be clearly shown in the margin(s).

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