

# 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 clearly in black ink	Do not write in the barcodes.	
Centre number	Candidate number	
First name(s)		
Last name		

#### **INSTRUCTIONS**

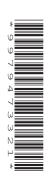
- Use black ink. You can use an HB pencil, but only for graphs and diagrams.
- Write your answer to each question in the space provided in the Printed Answer Booklet. If you need extra space use the lined pages at the end of the Printed Answer Booklet. The question numbers must be clearly shown.
- · 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  $g \, \mathrm{m} \, \mathrm{s}^{-2}$ . 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(c)	
2(d)	

3(a)							
	P	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	x	У	Z	S	t	RHS
<b>B(b)</b>							
-							
P	=						

3(c)								
3(d)								
	If needed for	working:						
	P	x	y	Z	S	t	RHS	
								1
	P	x	y	Z	S	t	RHS	
			ı	ı	1	1		J.

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

4(d)	

### DO NOT WRITE IN THIS SPACE

© OCR 2023

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

<b>5(d)</b>	

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

6(d)(i)	
	Lower bound =
6(d)(ii)	
	Upper bound =
6(e)	

7(a)(i)	Player 2							
			A	В	С			
		X	2	-3	-4			
	Player 1	Y	0	1	3			
		Z	-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(1)	
7(d)	
	x = y = z =
	Value of the game to player 1 =

### 14

### 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).



#### Copyright Information

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact The OCR Copyright Team, The Triangle Building, Shaftesbury Road, Cambridge CB2 8EA.

 ${\tt OCR}\ is\ part\ of\ Cambridge\ University\ Press\ \&\ Assessment,\ which\ is\ itself\ a\ department\ of\ the\ University\ of\ Cambridge.$