

**Cambridge IGCSE™**CANDIDATE  
NAMECENTRE  
NUMBER

--	--	--	--	--

CANDIDATE  
NUMBER

--	--	--	--

**CAMBRIDGE INTERNATIONAL MATHEMATICS****0607/53**

Paper 5 Investigation (Core)

**October/November 2025****1 hour 15 minutes**

You must answer on the question paper.

No additional materials are needed.

**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.
- You should use a graphic display calculator where appropriate.
- You may use tracing paper.
- You must show all necessary working clearly, including sketches, to gain full marks for correct methods.
- In this paper you will be awarded marks for providing full reasons, examples and steps in your working to communicate your mathematics clearly and precisely.

**INFORMATION**

- The total mark for this paper is 40.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **8** pages.

## INVESTIGATION ODD SETS

In this investigation, you will look at calculations made from an odd number of connected integers.

Use these steps.

- STEP 1 Write down an odd number of integers that increase by the same positive integer each time.  
 STEP 2 Multiply the first and last integers.  
 STEP 3 Square the middle integer.

Example

This is a set of 3 integers that increase by 1 each time.

- STEP 1 3, 4, 5  
 STEP 2  $3 \times 5 = 15$   
 STEP 3  $4^2 = 16$

- 1 (a) Complete this table.

STEP 1	STEP 2		STEP 3	
	Calculation	Answer	Calculation	Answer
1, 2, 3	$1 \times 3$	= 3	$2^2$	=
5, 6, 7	$5 \times 7$	=		= 36
8, 9, 10	$\times$	= 80	$9^2$	=
14, 15, 16	$\times$	=		= 225

[3]

- (b) Write down the connection between the answer to STEP 2 and the answer to STEP 3.

The answer to STEP 2 ..... [1]

- (c) In a set of 3 integers that increase by 1 each time:

- one of the integers in the calculation for STEP 2 is 23
- the answer to STEP 3 is 484.

Find the 3 integers.

....., ....., ..... [2]



2 In this question, a set of 3 integers increase by 2 each time.

(a) (i) Complete this set of 3 integers.

7, ....., .....

[1]

(ii) Work out the answers to STEP 2 and STEP 3.

STEP 2 .....

STEP 3 .....

[2]

(b) Make up 3 more sets of 3 integers that increase by 2 each time.

Investigate the connection between the answers to STEP 2 and STEP 3.  
Write down this connection.

Connection ..... [5]



- 3 In this question, a set of 3 positive integers increase by 3 each time.

(a) Complete the table.

STEP 1	STEP 2	STEP 3
1, 4, 7	$1 \times 7 = 7$	$4^2 =$
3, 6, 9	$3 \times 9 = 27$	$= 36$
10, 13, 16	$\times = 160$	$13^2 =$
	$\times = 315$	$= 324$

[4]

- (b) Write down the connection between the answer to STEP 2 and the answer to STEP 3.

The answer to STEP 2 ..... [1]

- 4 Complete this table for sets of 3 connected integers.  
Use your answers to **Question 1(b)**, **Question 2(b)** and **Question 3(b)** and any patterns you notice to help you.

Increase between integers each time	Answer to STEP 3 – Answer to STEP 2
1	
2	
3	
4	
5	
$k$	

[2]





5 For a set of 3 connected integers:

- the answer to STEP 3 – the answer to STEP 2 is 225
- the integers can be positive and negative
- the integers increase by the same positive integer,  $k$ , each time
- the answer to STEP 2 is  $-125$ .

Find 2 different sets of 3 integers for which this is true.

..... , ..... , ..... and ..... , ..... , ..... [4]



- 6 The first of a set of 3 integers is 10.  
The integers increase by  $k$  each time.  
Expressions for the integers are

$$10, \quad 10 + k, \quad 10 + 2k.$$

Complete this working to show that your expression in the last cell in **Question 4** is true.

STEP 3  $(10 + k)(10 + k) =$

STEP 2  $10(10 + 2k) =$

[4]





7 There are now 5 integers in a set.

The first integer is still 10.

The integers still increase by  $k$  each time.

- (a) Write an expression for the last integer in the set.  
Give your answer in its simplest form.

$$10, \quad 10+k, \quad 10+2k, \quad 10+3k, \quad \dots \quad [1]$$

- (b) Show that an expression for the answer to STEP 3 – STEP 2 is now  $4k^2$ .

[3]

- (c) Show that the expression in **part (b)** is true for this set of 5 integers.

$$6, \quad 10, \quad 14, \quad 18, \quad 22$$

[3]

**Question 7(d) is printed on the next page.**





- (d) The integer at one end of a set is 41.  
There are 5 integers in the set.  
The answer to STEP 3 – the answer to STEP 2 is 144.

Find both possible sets of 5 integers.

.....  
.....  
[4]

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](http://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.

