

Cambridge Lower Secondary Checkpoint

CANDIDATE
NAME

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CENTRE
NUMBER

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CANDIDATE
NUMBER

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MATHEMATICS

Paper 1

1112/01

October 2021

1 hour

You must answer on the question paper.

You will need: Geometrical instruments
Tracing paper (optional)

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 show all your working in the booklet.
- You are **not** allowed to use a calculator.

INFORMATION

- The total mark for this paper is 50.
- The number of marks for each question or part question is shown in brackets [].

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

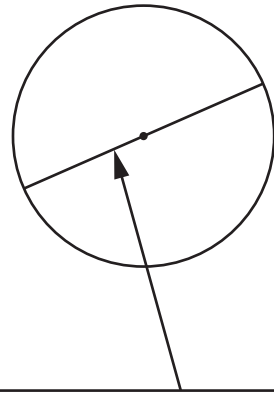
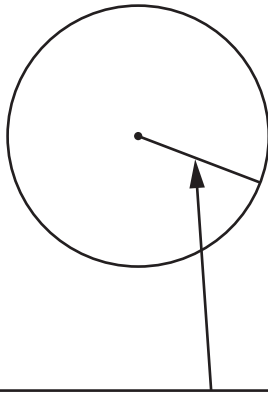
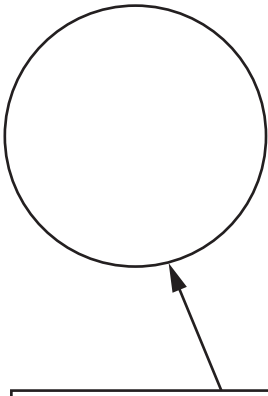
- 1 Write $\frac{64}{124}$ in its simplest form.

..... [1]

Mark Scheme:

	$\frac{16}{31} \text{cao}$	1	
--	----------------------------	---	--

2 Write in the boxes the correct name for each part of a circle.



[2]

Mark Scheme:

	circumference, radius and diameter	2	In correct order. Accept reasonable misspellings.
	one correct	B1	

3 All the rows, columns and diagonals add up to 15 in this grid.

3	4	8
10	5	0
2	6	7

Complete this grid so that all of the rows, columns and diagonals add up to 15

-3	12	
	5	
		13

[2]

Mark Scheme:

<table><tr><td>-3</td><td>12</td><td>6</td></tr><tr><td>14</td><td>5</td><td>-4</td></tr><tr><td>4</td><td>-2</td><td>13</td></tr></table>	-3	12	6	14	5	-4	4	-2	13	2	
-3	12	6									
14	5	-4									
4	-2	13									
for either 6 or -2 in the correct place.	B1										

4 Solve.

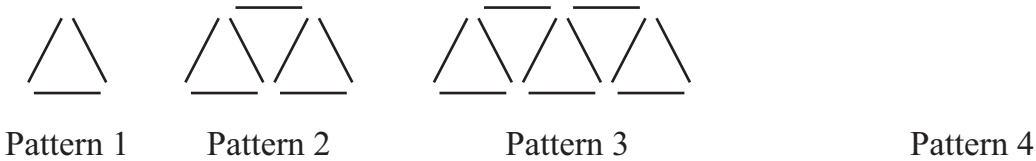
$$17 - 3x = 2$$

$$x = \text{.....} [2]$$

Mark Scheme:

[x =] 5	2	
$-3x = 2 - 17$ or $3x = 17 - 2$ or better	M1	Accept correct division of all terms by 3 or -3 e.g. $\frac{17}{3} - x = \frac{2}{3}$ for M1

5 The diagram shows the first three patterns of a sequence made from rods.



(a) Draw Pattern 4 in the sequence. [1]

(b) Complete the statement.

When the pattern number increases by 1,
the number of rods increases by [1]

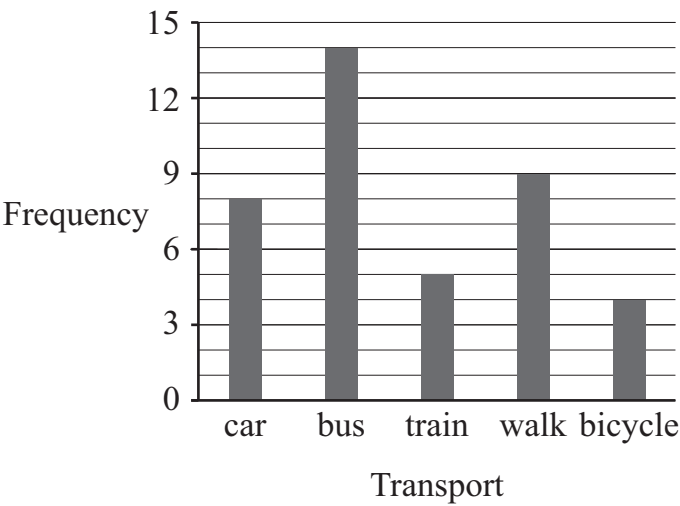
(c) Work out how many rods will be used for Pattern 7

..... [1]

Mark Scheme:

(a)		1	Accept diagram drawn in any position but must be correct orientation
(b)	4	1	
(c)	27	1	

6 The bar chart shows how students in Class 7 travel to school.



Tick (✓) to show if these statements are true or false.
One has been done for you.

	True	False
There are 40 students in Class 7	☒	☐
50% of the students travel by car or bus.	☐	☐
A quarter of the students walk to school.	☐	☐

Mark Scheme:

	True ☐ ☒	False ☐ ☒	1	Accept any clear indication
--	--	---	---	-----------------------------

7 Write 0.285 as a fraction in its simplest form.

..... [2]

Mark Scheme:

	$\frac{57}{200}$ cao	2	
	$\frac{285}{1000}$ oe fraction	B1	Note an equivalent fraction does not include decimals B0 for e.g. $\frac{28.5}{100}$

8 Write these measurements in order of size from smallest to largest.

540 m

504 cm

5.04 km

5400 mm

.....

smallest

.....

.....

.....

largest

[1]

Mark Scheme:

	504 [cm] 5400 [mm] 540 [m] 5.04 [km]	1	Accept correct conversions with units for any/all value(s). e.g. 504 cm 540 cm 54000 cm 504000 cm
--	--------------------------------------	---	--

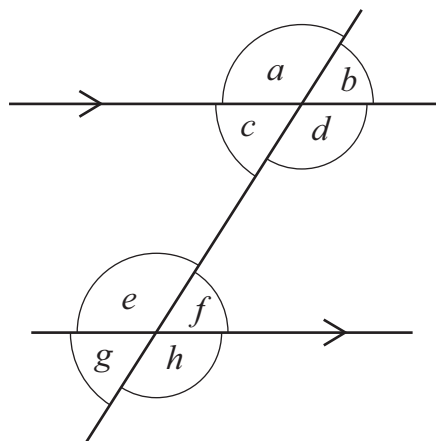
9 Pierre rolls a dice with four sides, numbered 1 to 4
He also throws a coin with two outcomes, H or T.

List all the possible outcomes.
One has been done for you.
You may not need to use all the rows.

Dice	n
1	

Mark Scheme:

	All outcomes listed [1H] 2H 3H 4H 1T 2T 3T 4T	1	Accept in any order. Do not accept repeats apart from 1H
--	--	----------	--



Choose one of these words to complete each sentence about the angles in the diagram.

reflex

corresponding

alternate

opposite

right

Angles b and f are angles.

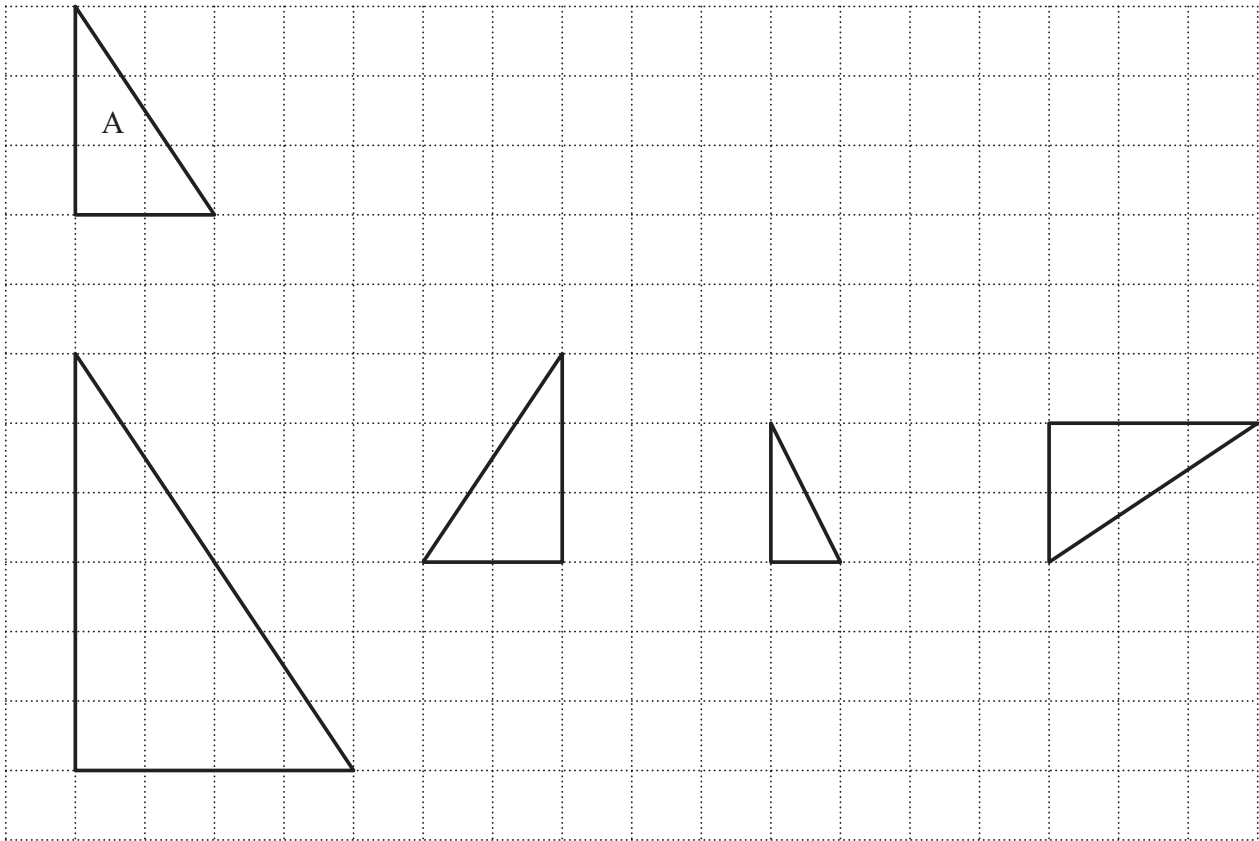
Angles d and e are angles.

[2]

Mark Scheme:

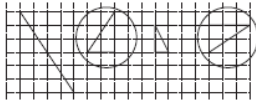
	corresponding and alternate	2	In the correct order. Accept reasonable misspellings.
	One correct sentence	B1	

11 Draw a ring around **all** the shapes that are congruent to triangle A.



[1]

Mark Scheme:

	1 Two correct triangles ringed and no others. Ignore ring around A Accept any clear indication.
---	--

12 Work out.

$$65 \div 9$$

Give your answer correct to two decimal places.

..... [2]

Mark Scheme:

7.22 cao	2	Do not accept recurring notation e.g. $7.\dot{2}\dot{2}$, $7.\overline{22}$, $7.22\dots$ award B1 for these
7.2 or 7.22[2...] or for <i>their</i> more accurate value correctly rounded to 2dp	B1	Could be in working.

13 Write a value in the box to make this statement correct.

$$28 \times 10 = 28 \div$$

[1]

Mark Scheme:

	0.1 or $\frac{1}{10}$ or 10^{-1}	1	
--	------------------------------------	---	--

14 (a) Work out.

$$2.46 \times 1.3$$

..... [2]

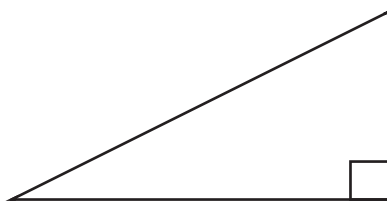
(b) Write your answer to part **(a)** correct to two significant figures.

..... [1]

Mark Scheme:

(a)	3.198	2	e.g. M1 for $\begin{array}{r} 246 \\ \times 13 \\ \hline 638 \\ 2460 \\ \hline 3098 \end{array}$ and answer 3.098 Error in the first 6 but everything else correct (FT the initial error). e.g. M0 for $\begin{array}{r} 246 \\ \times 13 \\ \hline 738 \\ 246 \\ \hline 984 \end{array}$ missing the 0 is not an arithmetic error, or e.g. adding tenths to units (even if the 0 is there) due to misalignment of columns or misplacement of decimal point in 738 and 2460 implied by figures 984 in answer Error is likely to be one incorrect digit in this correct working $\begin{array}{r} 246 \\ \times 13 \\ \hline 738 \\ 2460 \\ \hline 3198 \end{array}$	
(b)	3.2	1	Do not accept with trailing zeros e.g. 3.200 FT from their answer to part (a) provided a more accurate figure shown.	

15 Here is a right-angled triangle.



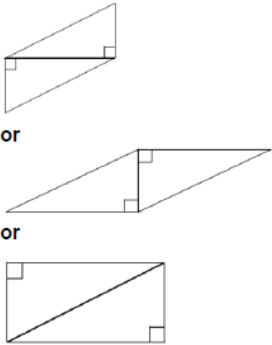
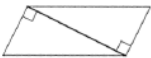
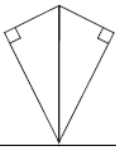
- (a) Sketch **two** of these right-angled triangles joined together to make a **parallelogram**.
You must mark the right angles in both triangles.

[1]

- (b) Sketch **two** of these right-angled triangles joined together to make a **kite**.
You must mark the right angles in both triangles.

[1]

Mark Scheme:

(a)		1	In any orientation e.g. 
(b)		1	In any orientation. Do not accept a square.

- 16** Eva measures the mass of 25 children.
She calculates the mean and the median of the masses.
Eva makes a mistake when measuring the mass of one child.
That child's actual mass is 5 kg greater than Eva's measurement.

Tick (✓) the correct response to each of these statements.

	Must be true	Must be false	Could be true or false
The correct mean is greater than Eva's mean.	☐	☐	☐
The correct median is greater than Eva's median.	☐	☐	☐

[1]

Mark Scheme:

	☒ ☐ ☐ ☐ ☐ ☒	1	In correct order. Accept any clear indication.
--	---	----------	---

17 Complete this statement using **consecutive** whole numbers.

$$\text{.....} < \sqrt{40} < \text{.....}$$

[1]

Mark Scheme:

	6 and 7	1	In correct order. Do not accept $\sqrt{36}$ and $\sqrt{49}$ or 6^2 and 7^2
--	---------	---	--

18 Carlos, Rajiv, Samira and Naomi share a bag of sweets.

Carlos eats $\frac{2}{5}$ of the sweets.

Rajiv eats $\frac{1}{6}$ of the sweets.

Samira and Naomi share the rest of the sweets equally.

Work out the fraction of the sweets that Samira gets.

..... [3]

Mark Scheme:

$\frac{13}{60}$	3	Accept equivalent fractions. Note it is not an equivalent fraction if it contains decimals, which is common in this question e.g. award M2 for $\frac{6.5}{30}$
$1 - \left(\frac{12}{30} + \frac{5}{30}\right)$ or better or for $\left(1 - \left(\frac{12}{30} + \frac{5}{30}\right)\right) \div 2$ correctly evaluated with one incorrect numerator from 12 or 5	M2	M2 implied by $\frac{13}{30}$ or equivalent fraction For M2 accept other correct equivalent fractions using a common denominator. i.e. no more than one arithmetic error
$\frac{12}{30}$ and $\frac{5}{30}$ or $\frac{6 \times 2 + 5 \times 1}{6 \times 5}$ or better or for $1 - \left(\frac{12}{30} + \frac{5}{30}\right)$ with one incorrect numerator or for evaluating correctly $\left(1 - \frac{a}{b}\right) \div 2$	M1	Accept other correct equivalent fractions using a common denominator. M1 implied by $\frac{17}{30}$ oe Where $\frac{a}{b}$ comes from any attempt to process $\frac{2}{5}$ and $\frac{1}{6}$ Award M1 for $\left(1 - \frac{a}{b}\right) \div 2$ even if they work in decimals provided their answer is correctly converted back to a fraction.

19 The first three terms of the sequence $3n^2 - 7n$ are

$$-4, \quad -2, \quad 6$$

Write down the first three terms of the sequence $3n^2 - 7n + 3$

....., [1]

Mark Scheme:

	-1, 1, 9	1	In correct order.
--	----------	---	-------------------

20 Mike conducts an experiment to find out if cars drive at different speeds on different days. He collects data about the speed of cars on the road between 12pm and 1pm on two different days. His data is shown in the back to back stem-and-leaf diagram.

Monday			Thursday	
	0	1	5	9
		2	0	7
	4	3	3	3
	2	4	1	7
9	2	5	4	5
8	1	6	6	
	5	7	4	9
	3	8		

Key: 2 | 4 | 1 represents 42 km/h on Monday and 41 km/h on Thursday

(a) Work out the difference in speed between the fastest car on Monday and the fastest car on Thursday.

..... km/h [1]

(b) Mike concludes that the speed of cars is lower when there are more cars on the road.

Explain how the data supports Mike’s conclusion.

.....
 [1]

Mark Scheme:

(a)	1 [km/h] not from wrong working	1	Accept –1 [km/h]
(b)	A comparison that identifies Monday as fewer cars and faster than Thursday. e.g. Monday with less cars/Thursday as more cars and Monday, as faster speeds/Thursday, as slower speeds /average for Monday is greater than average for Thursday	1	If no comparison accept correct supporting figures to imply comparison e.g. 12 cars Monday and 22 cars Thursday - Median is 59.5 on Monday and 44 on Thursday Accept mean, median or mode for "average" Ignore incorrect figures only if there is a correct comparison e.g. "Monday has less cars and the median for Monday is 59.5 which is greater than the median for Thursday which is 47" Comments with no reference to Thursday/Monday are unlikely to score, they're usually general comments about traffic conditions on the road rather than comments about the data and are often just a rewording of the question. However, you might be able to imply the days they mean by figures/calculations next to the stem and leaf diagram.

21 Hassan plays cricket.
The table shows the number of catches he makes in 50 games.

Number of catches	0	1	2	3	4	5
Frequency	8	11	12	13	4	2

(a) Use the table to estimate the probability that he makes exactly **one** catch in the next game he plays.

..... [1]

(b) Write down the modal number of catches.

..... [1]

(c) Find the median number of catches.

..... [1]

Mark Scheme:

(a)	$\frac{11}{50}$	1	Accept any equivalent answer e.g. 0.22, 22% Do not accept a ratio 11:50 or in words e.g. 11 out of 50
(b)	3	1	
(c)	2	1	

22 A hamster eats $\frac{2}{7}$ of a bag of carrots each day.

Work out how many days it takes the hamster to eat 8 whole bags of carrots.

..... [2]

Mark Scheme:

	28	2	
	$8 \div \frac{2}{7}$ or better	M1	Accept equivalent methods, e.g.
			$\frac{8}{1} \div \frac{2}{7}, \frac{56}{7} \div \frac{2}{7}, 8 \times \frac{7}{2}, 8 \times 3.5, 56 \div 2$ counting on 2 bags is 7 4 bags is 14 8 bags is 28

23 $a = 4$ and $t = -3$

Work out the value of $5at^2$

..... [1]

Mark Scheme:

180	1
-----	---

- 24** Mia has two ribbons.
One is 60 cm long and the other is 45 cm long.
Mia cuts both ribbons into pieces.
All the pieces have the same length.

Find the **greatest** possible length of each piece of ribbon.

..... cm [1]

Mark Scheme:

	15 [cm] not from wrong working	1	Just look out for working 60 – 45 no need to check otherwise
--	--------------------------------	---	--

25 Here is a number fact.

$$56 \times 94 = 5264$$

Use this fact to work out these calculations.

$$5.6 \times 0.94 = \text{.....}$$

$$5264 \div 0.56 = \text{.....}$$

[2]

Mark Scheme:

	5.264 and 9400	2	
	One correct	B1	

- 26** Trains travel between two stations.
The distance between the two stations is 200 kilometres.

The average speed of two trains is shown in the table.

Train	Average speed
A	100 kilometres per hour
B	80 kilometres per hour

Calculate the difference between the journey times of the two trains.
Give your answer in **minutes**.

..... minutes [2]

Mark Scheme:

	30 [minutes]	2	
	Any of • 2 [hours] • 2.5 [hours] oe • 120 [minutes] • 150 [minutes] • 0.5 [hours] • Half an hour	B1	

27 Write these numbers in order of size, starting with the smallest.

$$0.48 \times 10^4$$

$$16 \times 10^{-2}$$

$$7 \div 10^{-3}$$

$$175\,000 \div 10^4$$

.....
smallest

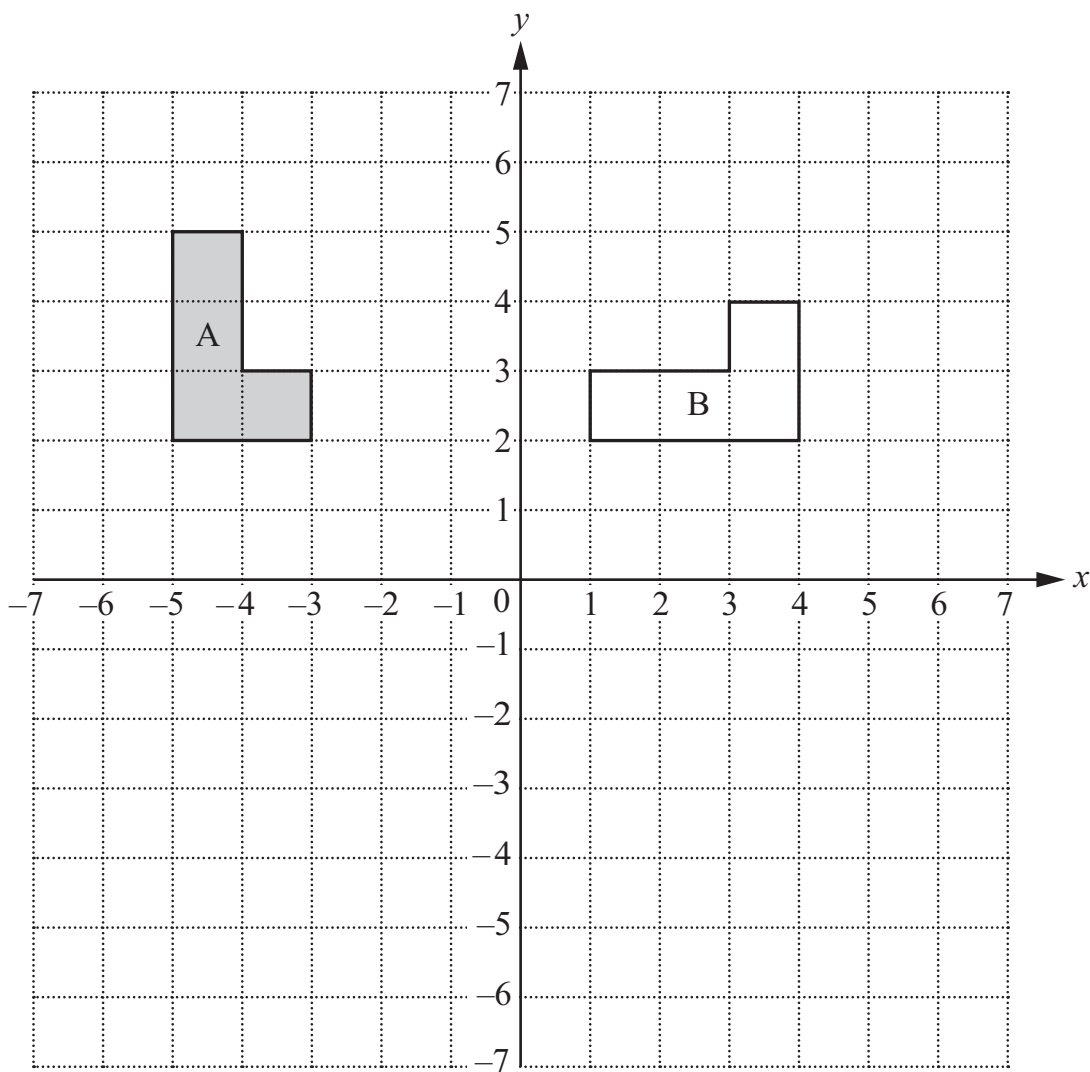
.....
largest

[2]

Mark Scheme:

	16×10^{-2} $175\,000 \div 10^4$ 0.48×10^4 $7 \div 10^{-3}$	2	Accept values given as 0.16 17.5 4800 7000 or a combination. Accept $\frac{16}{100}$ for 0.16
	For one incorrectly placed but the rest in the correct order. or for sight of at least three of 4800, 0.16, 7000 or 17.5	B1	Accept $\frac{16}{100}$ for 0.16

28 The diagram shows an object **A** and an image **B**.



A can be mapped onto **B** using a rotation centre (0,0) followed by a **different** type of transformation.

Complete the descriptions of the two transformations.

First transformation:

Rotation, _____, centre (0,0).

Followed by second transformation:

.....

Mark Scheme:

90° [anticlockwise] and translation and 6 right, 7 up or $\begin{pmatrix} 6 \\ 7 \end{pmatrix}$	3	Accept equivalents, e.g. 270° clockwise, -270° Award 0 if extra properties or transformations mentioned Award 0 if extra transformations mentioned treat extra properties as choice
Any two of the three elements correct.	B2	
For one of the three elements correct. or for correctly showing on the grid the image of <i>A</i> under a rotation, centre <i>O</i>, by 90°, anticlockwise.	B1	Ignore other shapes.