

Surname <i>StemUp Model Solution</i>	Centre Number	Candidate Number
First name(s)		0



GCSE

3300U10-1



S24-3300U10-1

THURSDAY, 16 MAY 2024 – MORNING

MATHEMATICS
UNIT 1: NON-CALCULATOR
FOUNDATION TIER

1 hour 30 minutes

ADDITIONAL MATERIALS

The use of a calculator is not permitted in this examination.
A ruler, protractor and a pair of compasses may be required.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

You may use a pencil for graphs and diagrams only.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

If you run out of space, use the additional page at the back of the booklet. Question numbers must be given for all work written on the additional page.

Take π as 3.14.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part-question.

In question 3, the assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing.

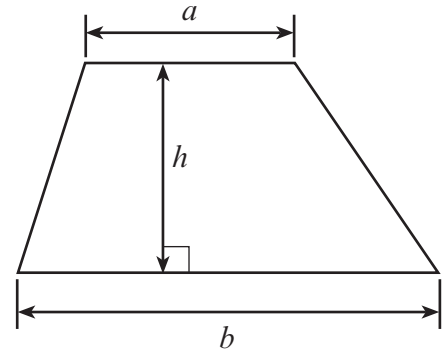
For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	2	
2.	2	
3.	6	
4.	2	
5.	3	
6.	3	
7.	4	
8.	2	
9.	4	
10.	2	
11.	3	
12.	2	
13.	2	
14.	3	
15.	5	
16.	4	
17.	4	
18.	7	
19.	5	
Total	65	



JUN243300U10101

Formula List – Foundation Tier

Area of trapezium $= \frac{1}{2} (a + b)h$



1. (a) Calculate 5620×100 .

[1]

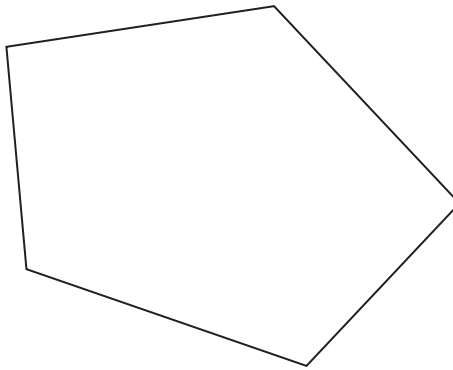
$$5620 \times 100 = 562\,000$$

- (b) Write 42 861 correct to the nearest hundred.

[1]

$$42\,861 \rightarrow 42\,900$$

2. (a)



What is the special name of the shape shown above?
Circle your answer.

[1]

pentagon

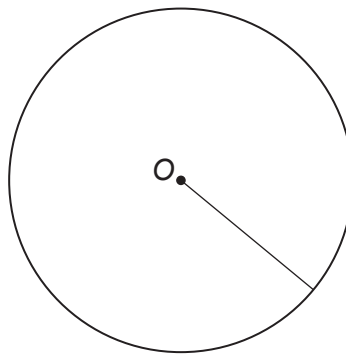
hexagon

kite

parallelogram

rhombus

- (b)



O is the centre of the circle shown above.

What is the special name of the straight line shown in the diagram?
Circle your answer.

[1]

circumference

tangent

diameter

radius

chord



3. In this question, you will be assessed on the quality of your organisation, communication and accuracy in writing.

Alex has four bags of beads.
Three of these bags contain 65 beads each.
The fourth bag contains 405 beads.

Alex pours all the beads from the four bags into an empty box.

Then, Alex shares all these beads equally between the four bags.

How many beads are there in each bag?

You must show all your working.

[4 + 2 OCW]

Beads in the three bags = $3 \times 65 = 195$ beads

Total number of beads in the box = $195 + 405 = 600$ beads

The 600 beads are shared equally between the 4 bags.

Number of beads in each bag = $600 \div 4$

$600 \div 4$: $600 \div 2 = 300$, $300 \div 2 = 150$

Number of beads in each bag = 150 beads

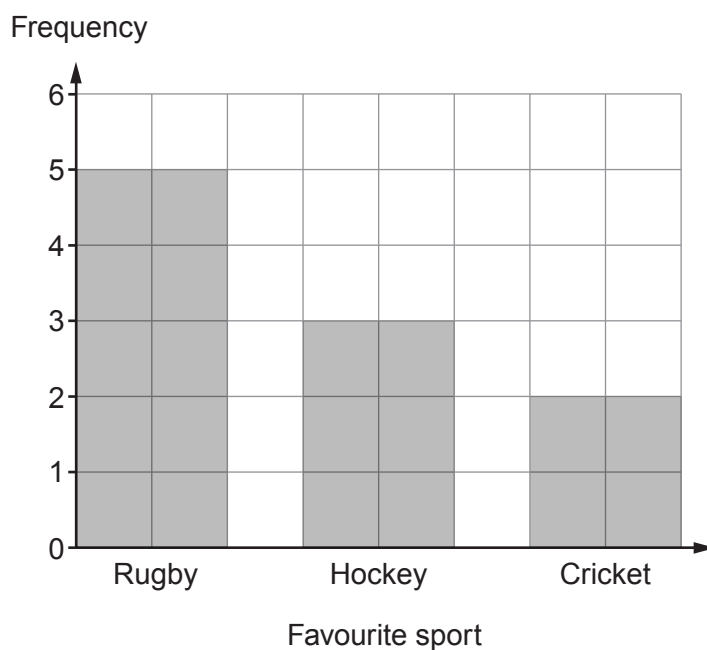
Check: $4 \times 150 = 600$ ✓

Conclusion: after sharing, there are 150 beads in each of the four bags.



4. Matilda asked 10 of her friends which was their favourite sport.

They each chose one of rugby, hockey or cricket.
Matilda showed the results of her survey in the bar chart below.



Matilda chooses one of her friends at random.

- (a) Describe the chance that the friend's favourite sport is cricket.
Circle the best expression from those below.

[1]

impossible unlikely an even chance likely certain

Cricket = 2 out of 10 friends

- (b) Describe the chance that the friend's favourite sport is rugby.
Circle the best expression from those below.

[1]

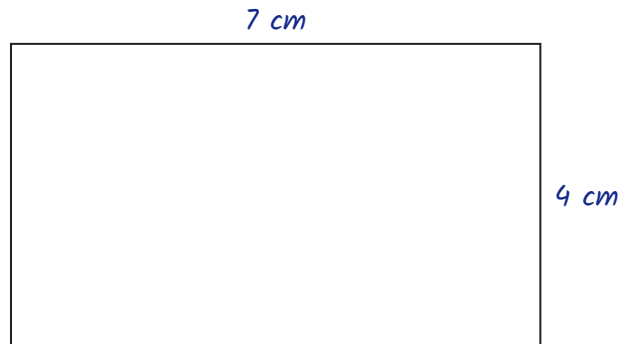
impossible unlikely an even chance likely certain

Rugby = 5 out of 10 friends = half



5. Find the perimeter of the rectangle below.
Give the units of your answer.

[3]



Measured: length = 7 cm , width = 4 cm

Perimeter = $7 + 4 + 7 + 4$

Perimeter = 22 cm

Perimeter = ... 22 cm

6. (a) Write down the next number in this sequence.

[1]

71, 79, 87, 95, ... 103

+8 each time: $95 + 8 = 103$

- (b) Write down the next two numbers in this sequence.

[2]

40 000, 20 000, 10 000, 5000, ... 2500 , ... 1250

Halve each time: $5000 \div 2 = 2500$, $2500 \div 2 = 1250$



7. (a) Simplify $5k - 8k + 6k$.

[1]

$$5k - 8k + 6k = -3k + 6k = 3k$$

- (b) Solve these equations.

(i) $15 + x = 60$

[1]

$$x = 60 - 15$$

$$x = 45$$

(ii) $20 - y = 9$

[1]

$$y = 20 - 9$$

$$y = 11$$

(iii) $6w = 54$

[1]

$$w = 54 \div 6$$

$$w = 9$$

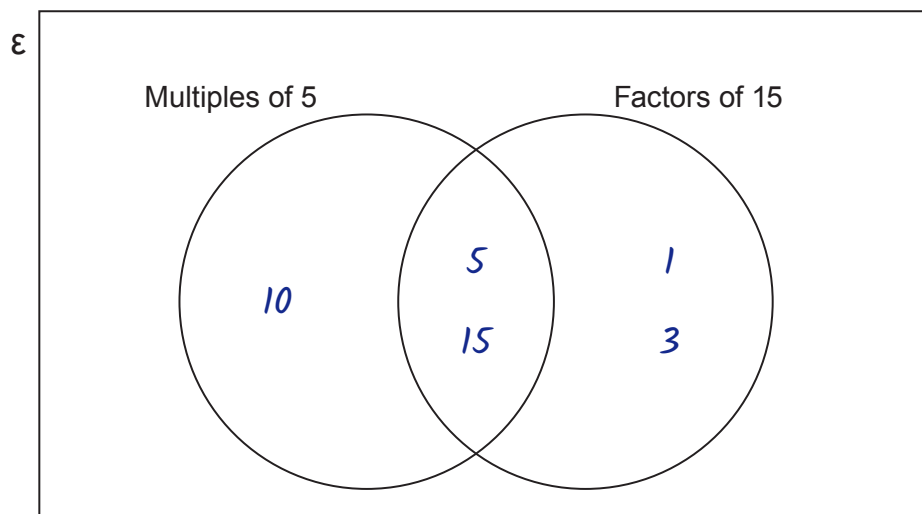
8. The Venn diagram below is used to show

- multiples of 5
- factors of 15.

Place the numbers **1**, **3**, **5**, **10** and **15** in the Venn diagram.

[2]

10 multiple of 5 only; 5, 15 both; 1, 3 factors of 15 only



9. Write down the value of each of the following.

(a) (i) 7^2 [1]

$$7 \times 7 = 49$$

(ii) $\sqrt{81}$ [1]

$$9 \times 9 = 81, \text{ so } \sqrt{81} = 9$$

(b) (i) Write 19.731 correct to 1 decimal place. [1]

19.7

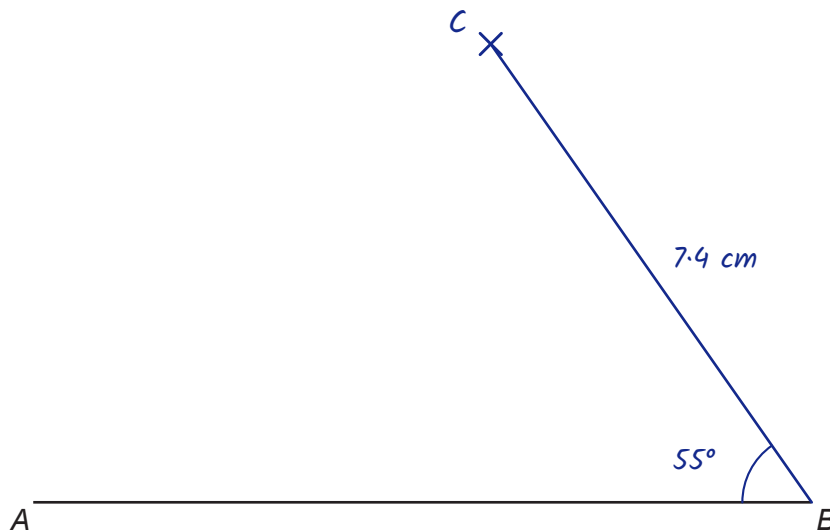
(ii) Write 65.4279 correct to 3 decimal places. [1]

65.428

10. On the diagram, mark the point C with a cross (×) so that:

- $\hat{ABC} = 55^\circ$ and
- $BC = 7.4 \text{ cm}$

[2]



11. Ifan has chosen four odd numbers.
Some of the numbers are the same and some of them are different.
Ifan's numbers are all less than 10.

Both the mode and the mean of Ifan's numbers are 7.

What numbers has Ifan chosen?

[3]

Mean = 7, so total of the four numbers = $4 \times 7 = 28$

Mode = 7, so 7 appears at least twice: 7, 7, ?, ?

The other two numbers add up to $28 - 7 - 7 = 14$

They must be odd, less than 10 and not both 7 (some numbers are different):

$1 + 13$ (13 too big), $3 + 11$ (11 too big), $5 + 9 = 14 \checkmark$

So the numbers are 5, 7, 7, 9

Check: $5 + 7 + 7 + 9 = 28$, $28 \div 4 = 7 \checkmark$ mode = 7 $\checkmark$

Ifan's numbers are

5

7

7

9

12. Evaluate each of the following.

(a) 0.8×0.25

[1]

$8 \times 25 = 200$ (3 decimal places)

$0.8 \times 0.25 = 0.200 = 0.2$

(b) $13.4 - 2.96$

[1]

13.40

$- 2.96$

10.44

$13.4 - 2.96 = 10.44$



13. (a) Which of the following is the nearest value to 488 grams?
Circle the correct answer.

[1]

0.5 kg

500 kg

50 kg

5 tonnes

0.05 kg

$$488 \text{ g} = 0.488 \text{ kg} \approx 0.5 \text{ kg}$$

- (b) Circle the correct answer for the following.
15 miles is approximately equal to

[1]

1500 m

24 km

15 km

2.4 km

3000 m

$$5 \text{ miles} \approx 8 \text{ km}, \text{ so } 15 \text{ miles} \approx 3 \times 8 = 24 \text{ km}$$

14. The n th term of a sequence is given by $5n - 1$.

Calculate the sum of the first three terms.

You must show all your working.

[3]

$$\text{1st term: } n = 1, 5 \times 1 - 1 = 4$$

$$\text{2nd term: } n = 2, 5 \times 2 - 1 = 9$$

$$\text{3rd term: } n = 3, 5 \times 3 - 1 = 14$$

$$\text{Sum} = 4 + 9 + 14 = 27$$

$$\text{Sum of the first three terms} = 27$$



15. In the diagram below, ABC is a right-angled triangle and CDE is an isosceles triangle.

$\hat{ABC} = 90^\circ$, $\hat{BAC} = 64^\circ$ and $CD = CE$.
 AD and BE are straight lines intersecting at C .

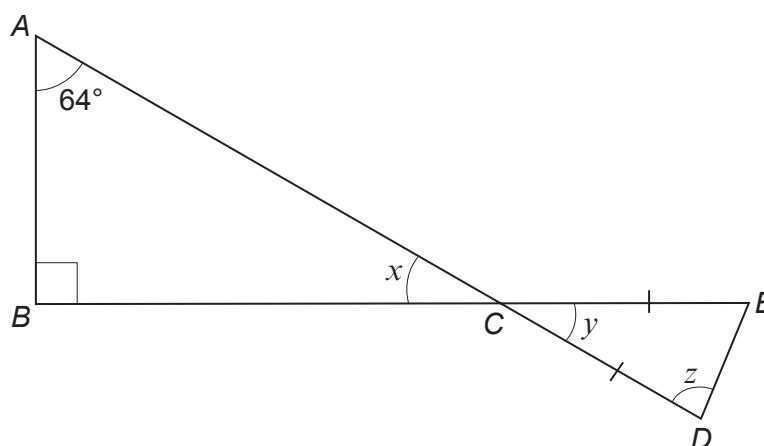


Diagram not drawn to scale

Calculate the size of each of the angles x , y and z .

[5]

Angles in a triangle add up to 180° : $x = 180^\circ - 90^\circ - 64^\circ = 26^\circ$

$y = x = 26^\circ$ (vertically opposite angles are equal)

$CD = CE$, so triangle CDE is isosceles and its base angles are equal.

Angles in a triangle add up to 180° :

$z = (180^\circ - 26^\circ) \div 2 = 154^\circ \div 2$

$z = 77^\circ$

$x = 26^\circ$ $y = 26^\circ$ $z = 77^\circ$



16. In a game, each competitor will have 20 attempts at throwing a ball into a bucket. They will get 1 point for every ball that lands in the bucket.

Sioned wants to keep a record of the total points for each competitor. She decides to show the results in a table with the total points recorded in **groups of equal width**.

- (a) She starts to draw a table using five groups, as shown below.

Total points	0 to 3	4 to 7	8 to 11	... to ...	... to ...
Number of competitors					

Explain why these groups will not be suitable.

[1]

The groups of width 4 go 0 to 3, 4 to 7, 8 to 11, 12 to 15, 16 to 19, so they only go up to 19. A competitor who scores 20 points (all 20 balls in the bucket) would not fit in any group.

- (b) Sioned considers using the table shown below. She decides that it is suitable for recording all the total points in **groups of equal width**. Fill in the two missing numbers in the **top** row.

[1]

Total points	0 to 6	7 to <u>13</u>	<u>14</u> to 20
Number of competitors			

*0 to 20 is 21 possible scores, $21 \div 3 = 7$ scores in each group
0 to 6, 7 to 13, 14 to 20*



- (c) Finally, Sioned decides to use the groups shown in the table below. The results for the first 100 competitors are shown in the table.

Total points	0 to 2	3 to 5	6 to 8	9 to 11	12 to 14	15 to 17	18 to 20
Number of competitors	5	10	17	22	23	12	11

One of these 100 competitors is chosen at random.

- (i) What is the probability that this competitor scored 6, 7 or 8 points? [1]

$$P(6, 7 \text{ or } 8 \text{ points}) = \frac{17}{100}$$

- (ii) Explain why the following statement may be incorrect. [1]

The probability that this competitor scored 19 points is $\frac{11}{100}$.

The 11 competitors are in the group 18 to 20, so they could have scored 18, 19 or 20. We do not know how many of them scored exactly 19, so 11 out of 100 is the probability of 18, 19 or 20 points.



17. (a) Express 96 as a percentage of 300.

[2]

$$\frac{96}{300} \times 100$$

$$= 96 \div 3$$

$$= 32\%$$

- (b) Share £48 in the ratio 1 : 7.

[2]

$$1 + 7 = 8 \text{ parts}$$

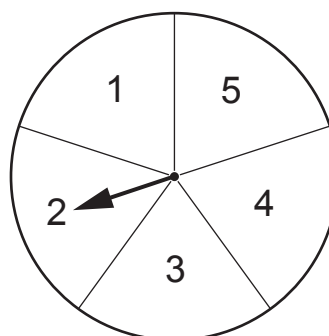
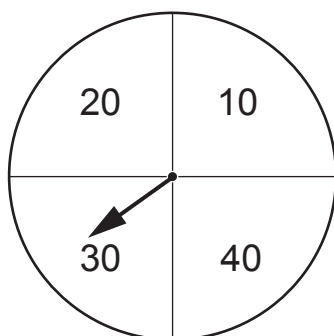
$$1 \text{ part} = £48 \div 8 = £6$$

$$7 \text{ parts} = 7 \times £6 = £42$$

$$£6 : £42$$



18. Ahmed organises a game using two fair spinners, as shown below.
The first spinner shows the values 10, 20, 30 and 40.
The second spinner shows the values 1, 2, 3, 4 and 5.



In the game, the two spinners are spun and the values shown are added to give a score.
For example, the spinners above score 32.

Ahmed charges £1 for each attempt at the game.
Any player who scores **43 or more** wins £5.

Calculate Ahmed's expected profit when this game is played 100 times.

[7]

Number of possible outcomes = $4 \times 5 = 20$ (all equally likely)

Scores of 43 or more: $40 + 3 = 43$, $40 + 4 = 44$, $40 + 5 = 45$

So 3 winning outcomes out of 20

$$P(\text{win}) = \frac{3}{20}$$

$$\text{Expected number of winners} = \frac{3}{20} \times 100 = 15 \text{ players}$$

$$\text{Money taken} = 100 \times £1 = £100$$

$$\text{Money paid out to winners} = 15 \times £5 = £75$$

$$\text{Expected profit} = £100 - £75$$

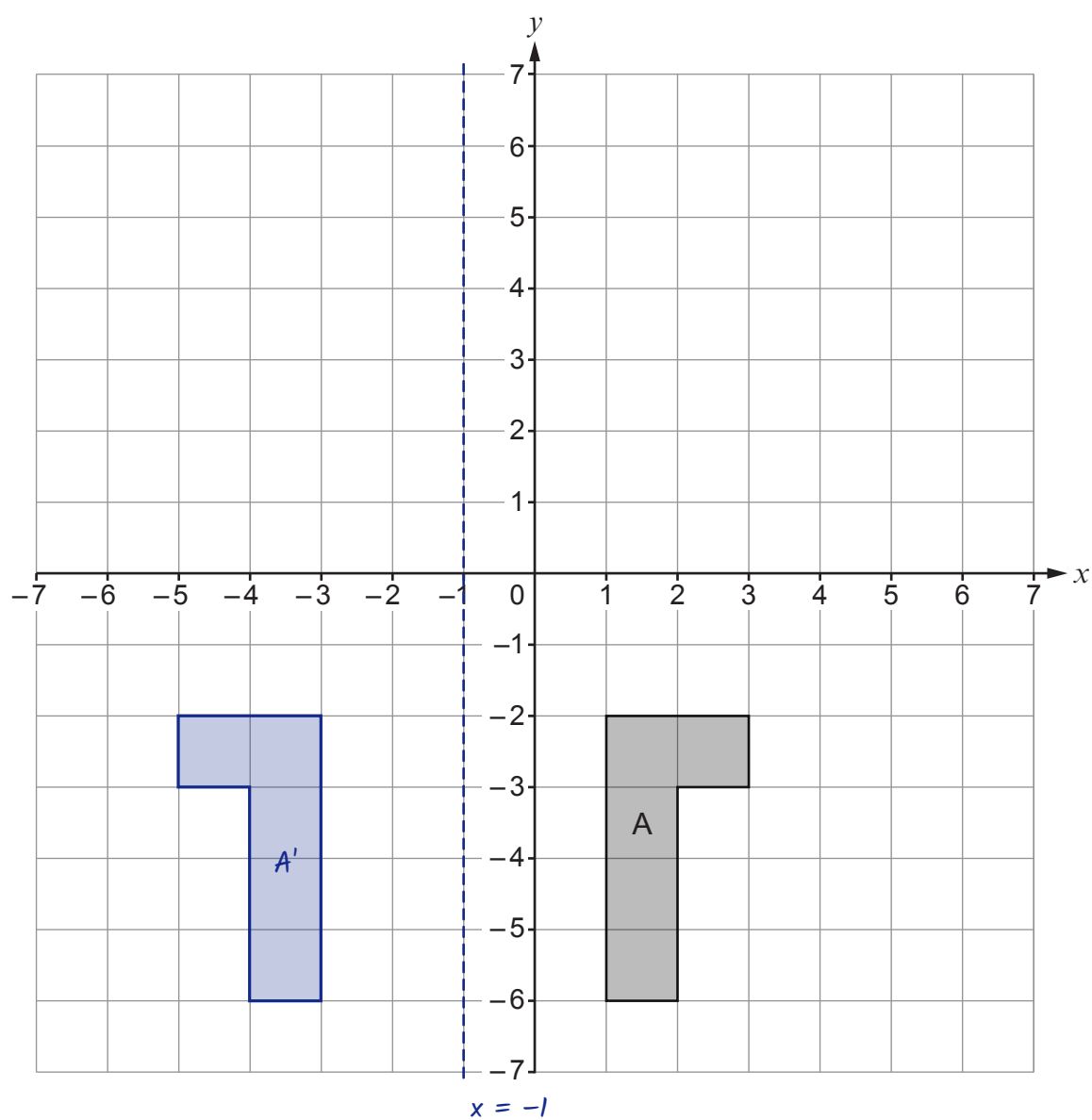
$$\text{Expected profit} = £25$$

Ahmed's expected profit for 100 games is £25.

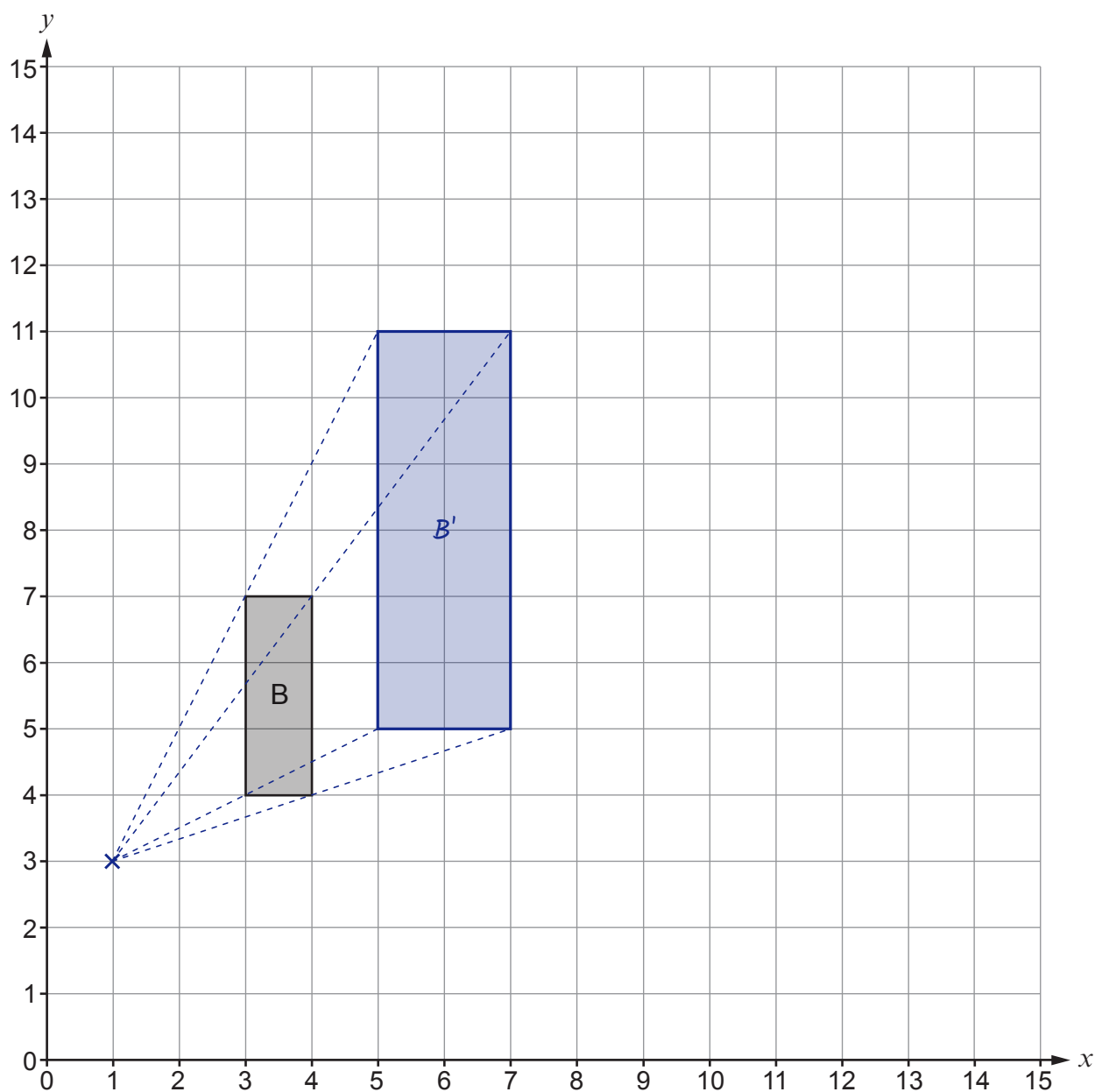


19. (a) Reflect the shape A in the line $x = -1$.

[2]



- (b) Enlarge the shape B by a scale factor of 2, using (1, 3) as the centre of enlargement. [3]



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