

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Pages	Mark
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TOTAL	



General Certificate of Secondary Education
Foundation Tier
June 2010

Mathematics (Specification A)

4306/2F

F

Paper 2 Calculator

Friday 11 June 2010 9.00 am to 10.30 am

<p>For this paper you must have:</p> <ul style="list-style-type: none"> mathematical instruments. <p>You may use a calculator.</p>	
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Time allowed

- 1 hour 30 minutes

Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 100.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer booklet.

Advice

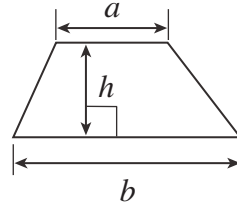
- In all calculations, show clearly how you work out your answer.



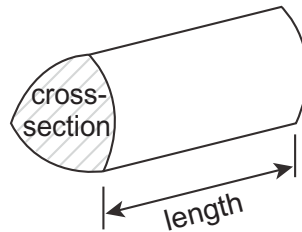
J U N 1 0 4 3 0 6 2 F 0 1

Formulae Sheet: Foundation Tier

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



Volume of prism = area of cross-section \times length



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

- 1 (a) Complete this shopping bill.

2.5 kg of potatoes at £ 1.14 per kg.	
8 lemons at 28 p each.	
Total	

(3 marks)

- 1 (b) How many books costing £ 3.75 each can be bought for £ 20?

.....

.....

Answer (2 marks)

- 2 Complete the table of equivalent fractions, decimals and percentages.

Fraction	Decimal	Percentage %
$\frac{1}{4}$	0.25	25
$\frac{1}{5}$		20
$\frac{13}{100}$	0.13	
	0.05	

(3 marks)



3 (a) On one day the temperatures at 3 am in four cities are recorded.

City	Temperature (°C)
London	3
Oslo	-5
Rome	6
New York	-10

3 (a) (i) Which city has the highest temperature?

Answer (1 mark)

3 (a) (ii) Which city has the lowest temperature?

Answer (1 mark)

3 (b) The wind chill tells you how much colder you feel in a wind.

Temperature out of a wind + Wind chill = Temperature you feel in a wind

Complete the table.

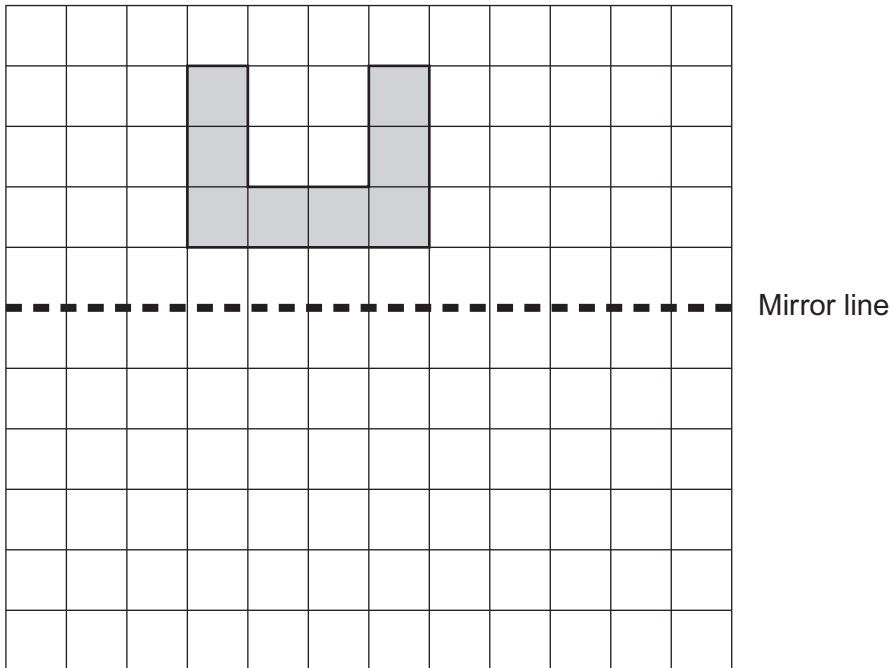
Temperature out of a wind	Wind chill	Temperature you feel in a wind
5	-6	-1
-2	-7	
	-11	-10
-2		-12

(3 marks)



4

Draw the reflection of the shape in the mirror line.



(2 marks)

Turn over for the next question



5 The cost of hiring a boat is given by the formula

$$\text{Cost of hire} = \text{Hourly cost} \times \text{Number of hours}$$

The hourly cost is £ 7.50

5 (a) Asif hires a boat for three hours.

What is the cost of hire?

.....

Answer £ (2 marks)

5 (b) Sunni pays £ 37.50 for hiring the boat.

For how many hours does he hire the boat?

.....

Answer hours (2 marks)



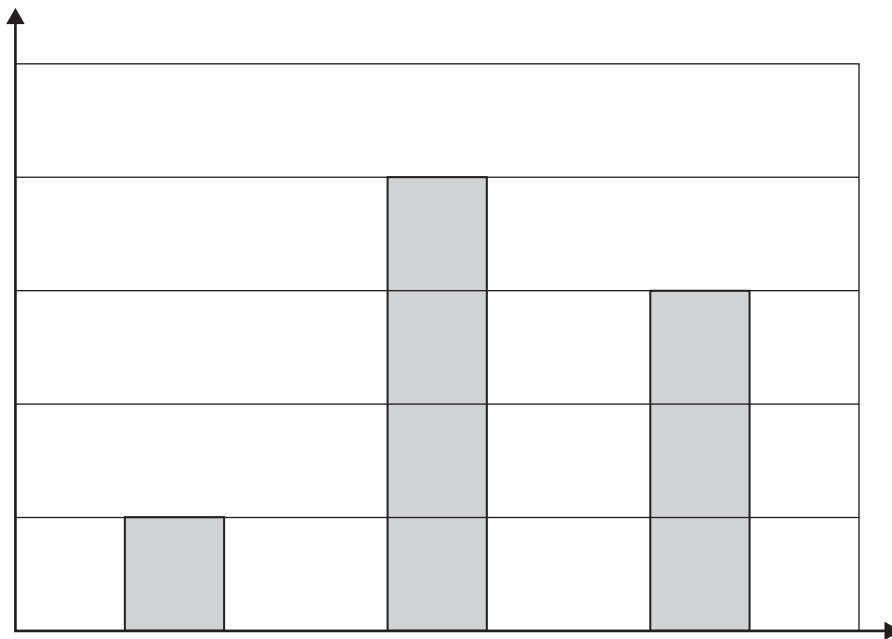
- 6 The table shows information about three items sold in a shop.

Item	Number sold
Calculator	20
Ruler	5
Pencil	15

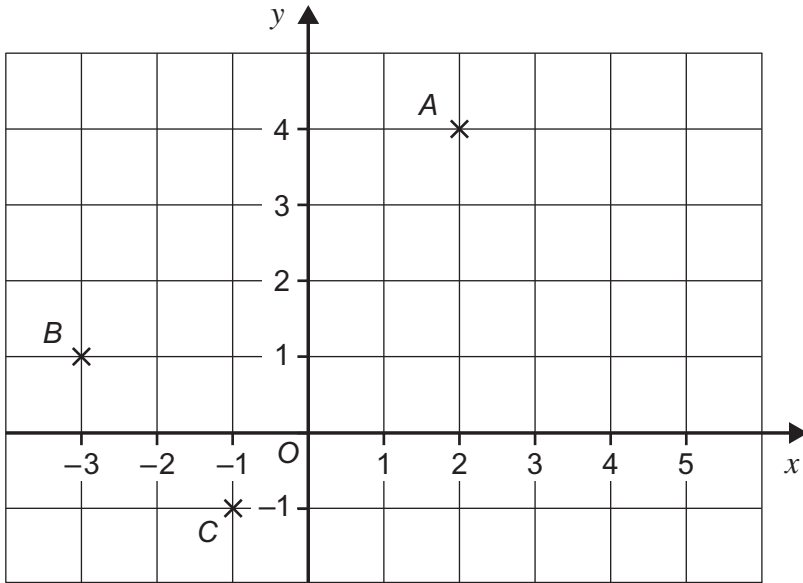
The bar chart shows the same information.

Complete a fully labelled bar chart, including a scale on the vertical axis.

(3 marks)



7



7 (a) Write down the coordinates of A , B and C .

Answer A (.....,

B (.....,

C (.....,

(3 marks)

7 (b) Join the points A , B , C to form a triangle.

Write down the special name of this triangle.

Answer (1 mark)

7 (c) Write down the coordinates of the midpoint of BC .

Answer (.....,)(1 mark)



8 (a) A sequence starts

49 46 43 40

8 (a) (i) Write down the next two terms.

Answer and (2 marks)

8 (a) (ii) What is the rule for continuing the sequence?

Answer (1 mark)

8 (b) Another sequence starts

57 50 43 36

This sequence is continued.

What is the first negative number in this sequence?

.....
.....

Answer (1 mark)

8 (c) The first sequence is also continued.
The two sequences have the number 43 in common.

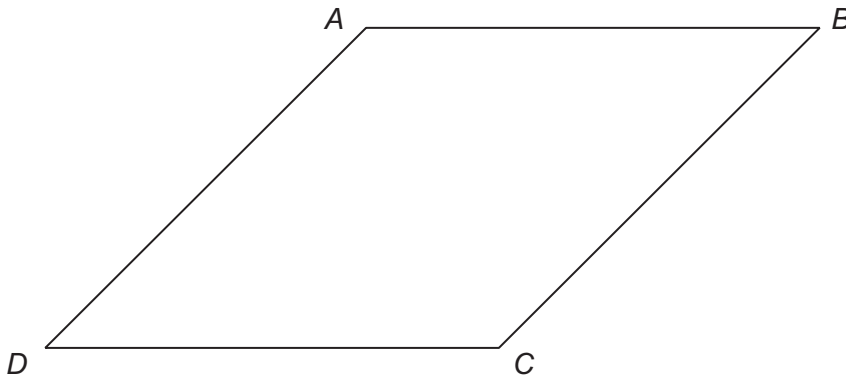
What is the next number that the two sequences have in common?

.....
.....

Answer (2 marks)



9 The quadrilateral $ABCD$ is drawn accurately.



9 (a) (i) Which of these is the special name for the quadrilateral $ABCD$?
Circle the correct answer.

Kite **Rhombus** **Trapezium**

(1 mark)

9 (a) (ii) Explain your choice.

.....

.....

(1 mark)

9 (b) Measure the length AC .
Give your answer in millimetres.

Answer mm (1 mark)

9 (c) Another quadrilateral $EFGH$ has all of its angles 90° .
Complete the statement.

The quadrilateral $EFGH$ must be a or a (1 mark)



10 (a) Which of the following would be the most appropriate height for an adult male?

- 180mm 180cm 180m 180km

Answer (1 mark)

10 (b) The height of Nelson’s column in Trafalgar Square, London, is 52 metres.

1 metre = 3.25 feet

Work out the height of Nelson’s column in feet.

.....

Answer feet (2 marks)

11 Calculate the mean of these eight numbers.

- 3 8 4 6 8 5 1 9

.....

.....

.....

.....

Answer (3 marks)



12 Abigail has a pile of 20p coins and a pile of 50p coins.



20p coins



50p coins

She can use coins from the piles to make different totals.

12 (a) Complete the table.

.....

.....

.....

Number of 20p coins	Number of 50p coins	Total (£)
2	6	3.40
3		3.10
	9	5.90

(2 marks)

12 (b) Explain why Abigail **cannot** make a total of £6.50 using just 20p coins?

.....

.....

(1 mark)



12 (c) List the **four** ways Abigail can make a total of £3

Answer 1

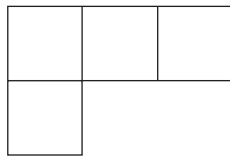
Answer 2

Answer 3

Answer 4

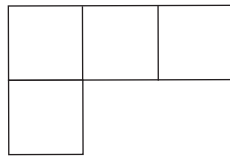
(2 marks)

13 This shape is made from squares.



One square is added to give the shape one line of symmetry.

Show **two** different ways that this can be done.



(2 marks)



14 The cost for one person to go to a concert is made up of three parts

$$\text{travel} + \text{meals} + \text{ticket}$$

Four people share a car to go to a concert.
They pay £20 each for the travel costs.
The meals are a set price of £12.50 for each person.
The table shows some of the costs.

	Cost for 1 person (£)	Cost for 4 people (£)
Travel	20	80
Meals	12.50	
Ticket		
Total		242

Work out the cost of one ticket.

.....

.....

.....

.....

Answer £ (4 marks)



15 The stem-and-leaf diagram shows the ages, in years, of some members of a golf club.

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

Key:
1 | 4 represents an age of 14 years

15 (a) How many members' ages are recorded?

.....

Answer (1 mark)

15 (b) How many members are older than 36?

.....

Answer (1 mark)

15 (c) What is the range of the ages?

.....

Answer years (1 mark)

15 (d) What is the median age?

.....

Answer years (1 mark)



16 (a) Use your calculator to evaluate

$$\frac{9.3 + 7.9}{4.6 - 2.7}$$

16 (a) (i) Write down your full calculator display.

Answer (1 mark)

16 (a) (ii) Give your answer to one decimal place.

Answer (1 mark)

16 (b) Calculate $4.6^3 + \text{square root of } 1278$

Answer (1 mark)

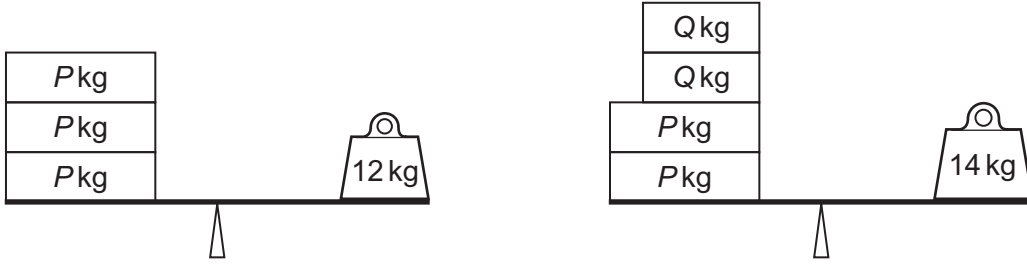
16 (c) The cube of a number is the same as the square of the number.
What could the number be?

.....

Answer (1 mark)



17 Kelly has some tins that weigh P kg and some tins that weigh Q kg. She finds that the following combinations of tins balance with the weights shown on the scales.



Find the value of Q .

.....

.....

.....

Answer (3 marks)

18 (a) Find the volume of a cuboid with edges 2cm, 4cm and 5cm?

.....

.....

Answer cm^3 (2 marks)

18 (b) A cube has a volume of 216 cm^3 .

What is the length of an edge of the cube?

.....

.....

Answer cm (2 marks)



19 An item is bought for £26 and sold for a 34% profit.

What is the selling price?

.....
.....
.....

Answer £ (3 marks)

20 Share £47 between Adam and Beth so that Adam gets four times as much as Beth.

.....
.....
.....

Answer Adam £
Beth £ (2 marks)



21 The table shows the year and gender of a sample of 50 pupils.

	Year Group					Total
	Yr7	Yr8	Yr9	Yr10	Yr11	
Number of boys	3	5	6	2	6	22
Number of girls	4	5	7	6	6	28

21 (a) What percentage of the sample is in Year 11?

.....

Answer % (1 mark)

21 (b) A pupil from the sample is picked at random.

What is the probability that the pupil is in Year 8?
Give your answer as a fraction in its simplest form.

.....

Answer (2 marks)

21 (c) There are 1500 pupils in the school altogether.

Use the table to estimate the number of boys in the school.

.....

.....

Answer (2 marks)

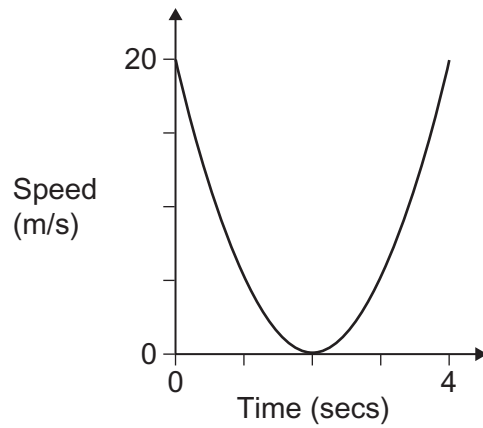
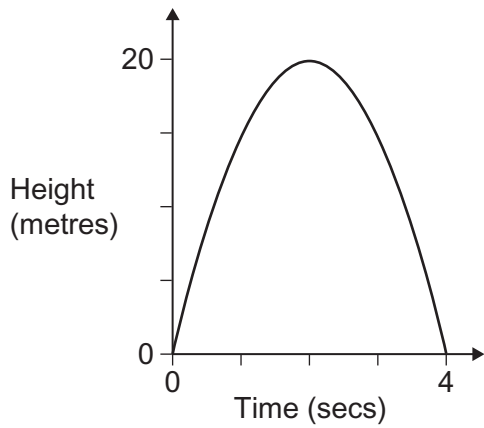


22

Mary throws a ball straight up in the air and catches it again after 4 seconds.



The first graph shows the height of the ball above Mary's hand.
The second graph shows the speed of the ball.



In each pair of statements, one statement is True and one statement is False.
Tick the statement that is True.

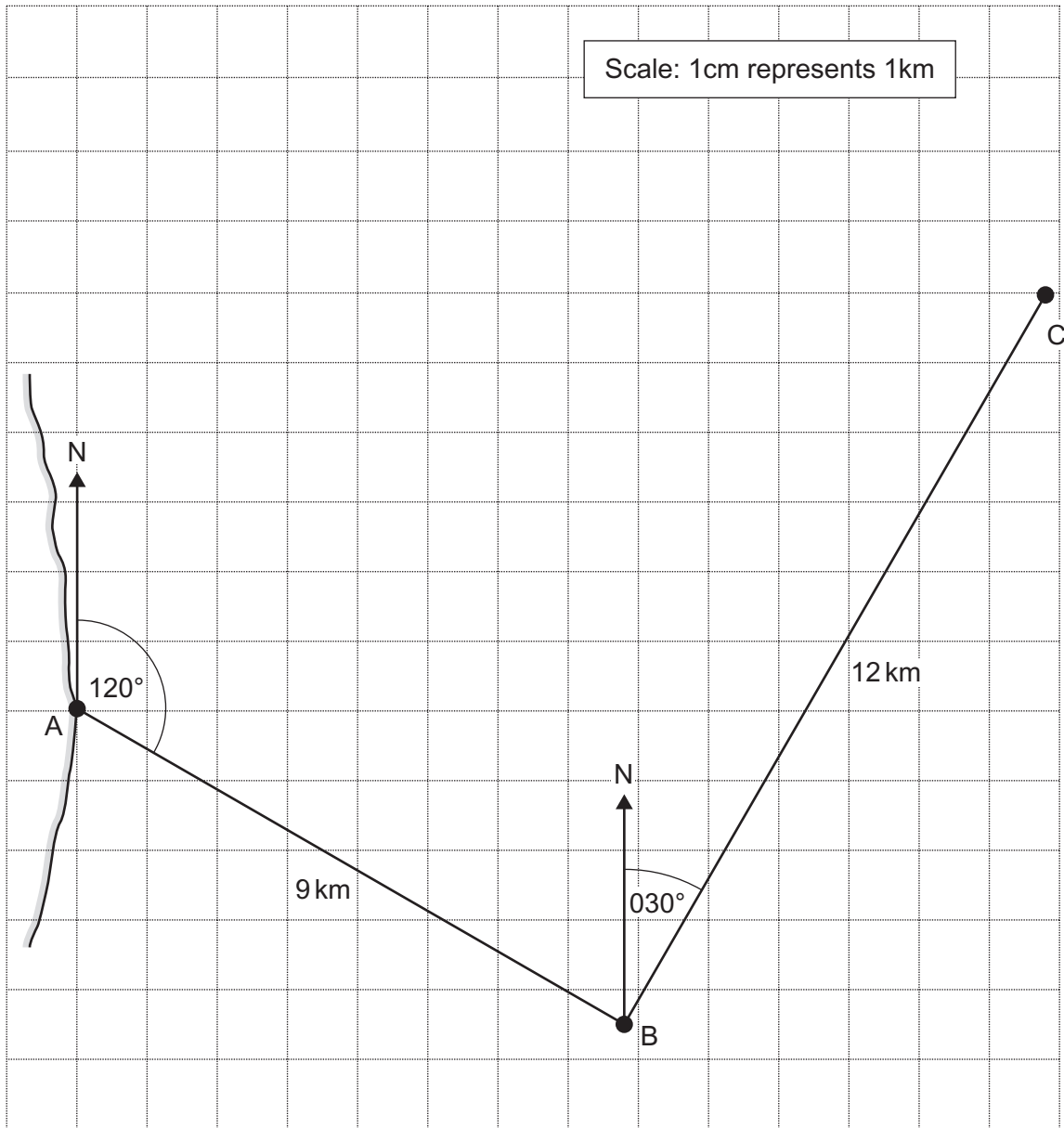
- | | | Tick if
true |
|-----|--|--------------------------|
| (a) | The ball is at the highest point after 2 seconds. | <input type="checkbox"/> |
| | The ball is at the highest point after 4 seconds. | <input type="checkbox"/> |
| (b) | The speed of the ball is 20 m/s after 2 seconds. | <input type="checkbox"/> |
| | The speed of the ball is 0 m/s after 2 seconds. | <input type="checkbox"/> |
| (c) | When the height of the ball is 20m, the speed is 0 m/s. | <input type="checkbox"/> |
| | When the height of the ball is 20m, the speed is 20 m/s. | <input type="checkbox"/> |

(3 marks)



23

A ship leaves port A and travels 9 km on a bearing of 120° to point B. The ship then turns and travels 12 km on a bearing of 030° to point C. This journey is shown on the scale drawing below.



The ship then turns and travels directly back from C to A.

Use a ruler and protractor to work out the distance and bearing of the journey from C to A

Distance km

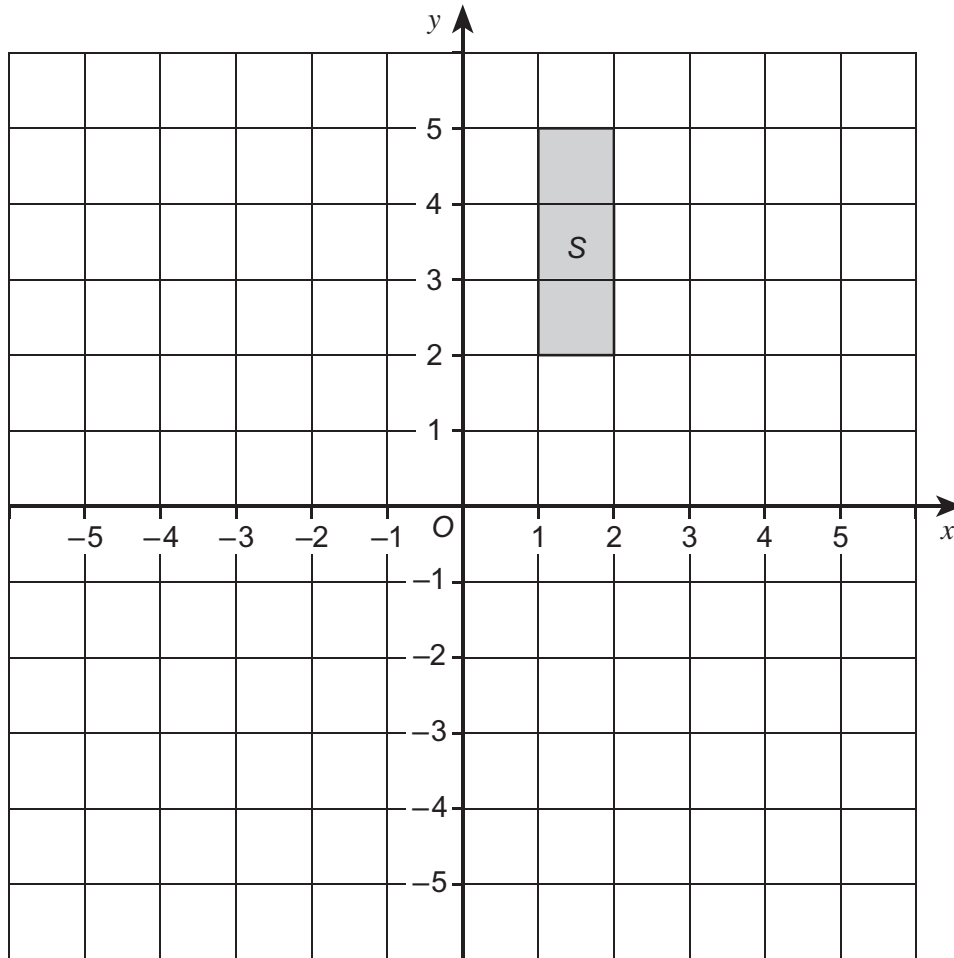
Bearing $^\circ$ (3 marks)

6

Turn over ►



24



- 24 (a)** Reflect shape S in the line $y = x$
Label it R .

(2 marks)

- 24 (b)** Translate the shape S by the vector $\begin{pmatrix} -3 \\ -4 \end{pmatrix}$
Label it T .

(2 marks)



25 p is a prime number.

25 (a) Is the expression $p^2 + 6$ always even, always odd or could it be either odd or even?

Tick the correct box

Always even

Always odd

Could be either
odd or even

.....
(1 mark)

25 (b) n and p are **both** prime numbers.

Work out values of n and p so that

$$n = p^2 + 6$$

.....
.....
.....

Answer $n =$ $p =$ (2 marks)

25 (c) Rearrange the formula $n = p^2 + 6$ to make p the subject.

.....
.....
.....

Answer (2 marks)



26 (a) Amy, Dev and Kaz are playing with a normal fair dice.
They each predict the next seven throws.

Amy	1	2	1	2	1	2	1
Dev	3	5	2	2	4	6	1
Kaz	4	4	4	4	4	4	4

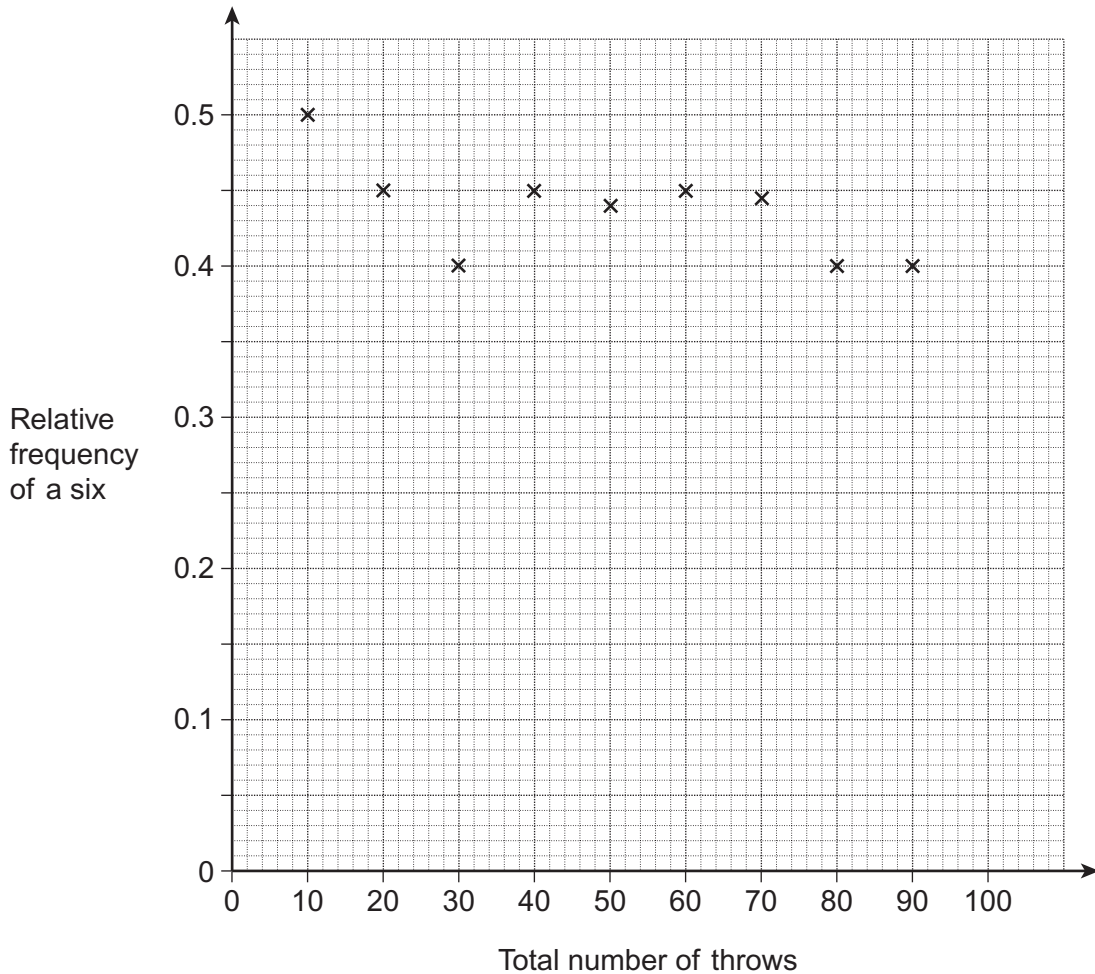
Which, if any, of these predictions is the most likely?
Circle your choice and explain your answer.

Amy Dev Kaz All are equally likely

Explanation

.....
(2 marks)

26 (b) Mia makes a six-sided dice.
To test the dice she throws it 100 times.
After each 10 throws she records the number of sixes thrown.
The relative frequencies for the first 90 throws are shown on the graph.



26 (b) (i) How many sixes were there in the first 10 throws?

Answer (1 mark)

26 (b) (ii) After 100 throws there were 42 sixes.

Calculate and plot the relative frequency of a six after 100 throws.

..... (1 mark)

26 (b) (iii) How many sixes would you expect to get after 100 throws of a **fair** dice?

.....
Answer (1 mark)

26 (b) (iv) Is Mia's dice fair?

Tick the correct box.

Yes

No

Give a reason for your answer

.....
.....
..... (1 mark)

END OF QUESTIONS



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