



CANDIDATE  
NAME

|  |
|--|
|  |
|--|

CENTRE  
NUMBER

|  |  |  |  |  |
|--|--|--|--|--|
|  |  |  |  |  |
|--|--|--|--|--|

CANDIDATE  
NUMBER

|  |  |  |  |
|--|--|--|--|
|  |  |  |  |
|--|--|--|--|

## 0580/32

February/March 2022

**2 hours**

You must answer on the question paper.

You will need: Geometrical instruments

- 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 calculator where appropriate.
- You may use tracing paper.
- You must show all necessary working clearly.
- Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place for angles in degrees, unless a different level of accuracy is specified in the question.
- For  $\pi$ , use either your calculator value or 3.142.

- The total mark for this paper is 104.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **20** pages. Any blank pages are indicated.

- 1 (a) One day, Mahika records the number of teachers and students who cycle to school.

|          | Tally | Frequency |
|----------|-------|-----------|
| Teachers |       |           |
| Students |       |           |

- (i) Complete the frequency column in the table. [1]

- (ii) Work out the percentage of people who cycle that are students.

..... % [2]

- (b) Mahika records how 120 students from Year 1 and Year 2 travel to school.  
Each student walks, cycles or travels by bus.

- 48 students are in Year 1.
- 77 students walk.
- 5 students in Year 2 cycle.
- 36 students travel by bus.
- $\frac{4}{9}$  of the students who travel by bus are in Year 1.

- (i) Complete the table.

|        | Walk | Cycle | Bus | Total |
|--------|------|-------|-----|-------|
| Year 1 |      |       |     |       |
| Year 2 |      |       |     |       |
| Total  |      |       |     | 120   |

[3]

- (ii) One of the 120 students is chosen at random.

Work out the probability that this student does not travel by bus to school.

..... [2]

- (c) There have been 24 complaints about one of the buses.

The complaints are:

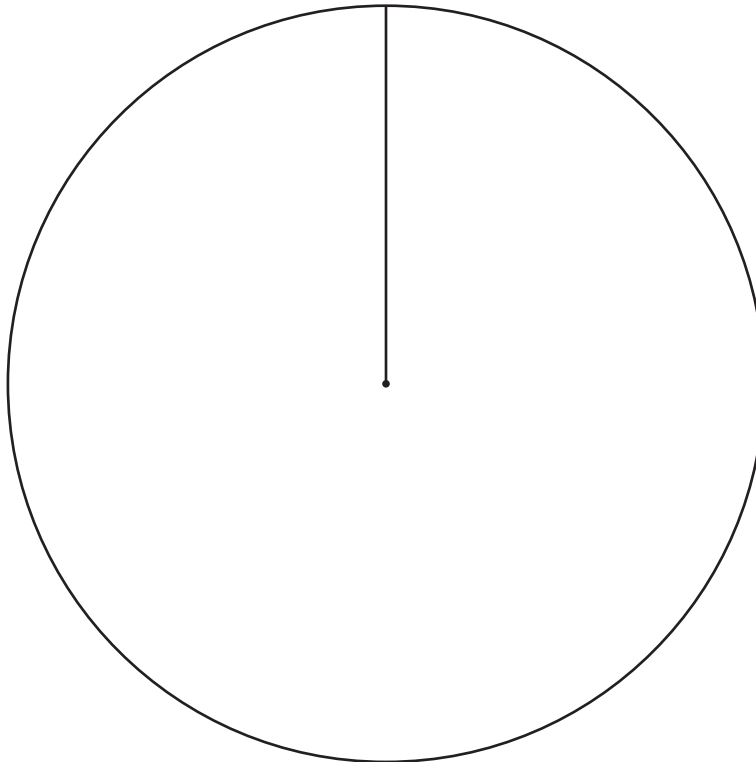
- The bus is late.
- The price is too high.
- The bus is crowded.

- (i) Complete the table.

| Complaint | Frequency | Pie chart sector angle |
|-----------|-----------|------------------------|
| Late      | 10        |                        |
| Price     | 6         |                        |
| Crowded   | 8         |                        |

[2]

- (ii) Complete the pie chart.

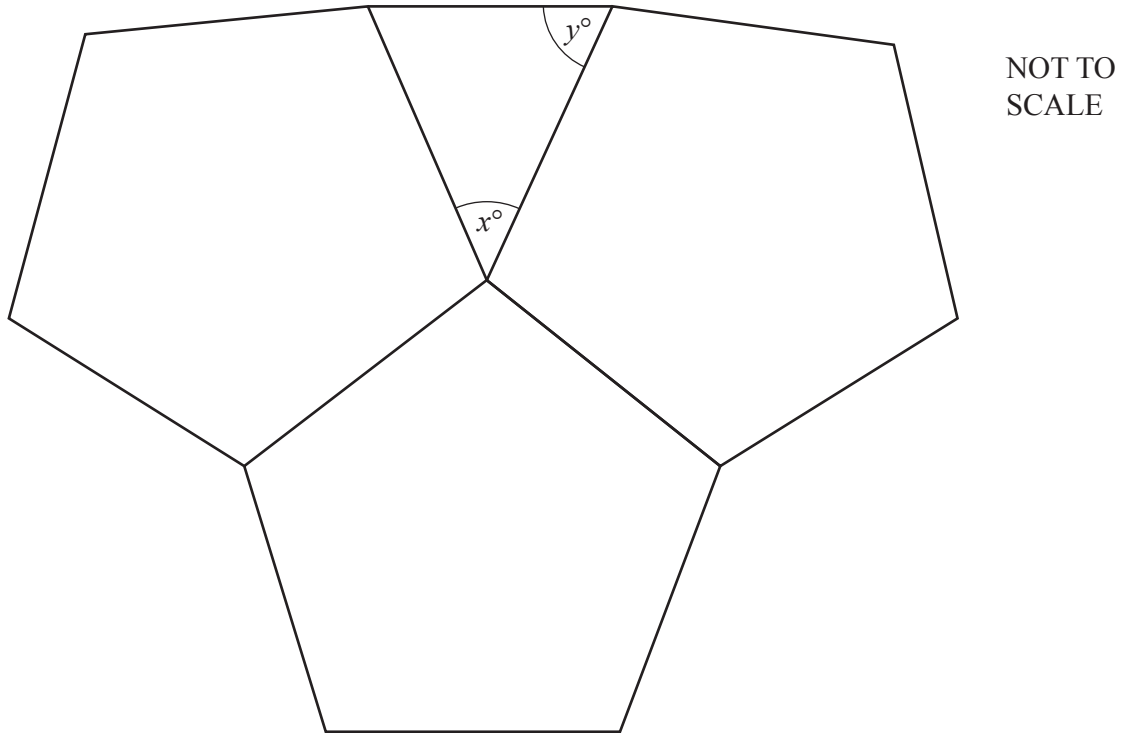


[2]

- 2 (a) Calculate the interior angle of a regular pentagon.

..... [2]

- (b) The diagram shows three congruent regular pentagons and a triangle.



- (i) Work out the value of  $x$ .  
Give a geometrical reason for your answer.

$x =$  ..... because .....

..... [2]

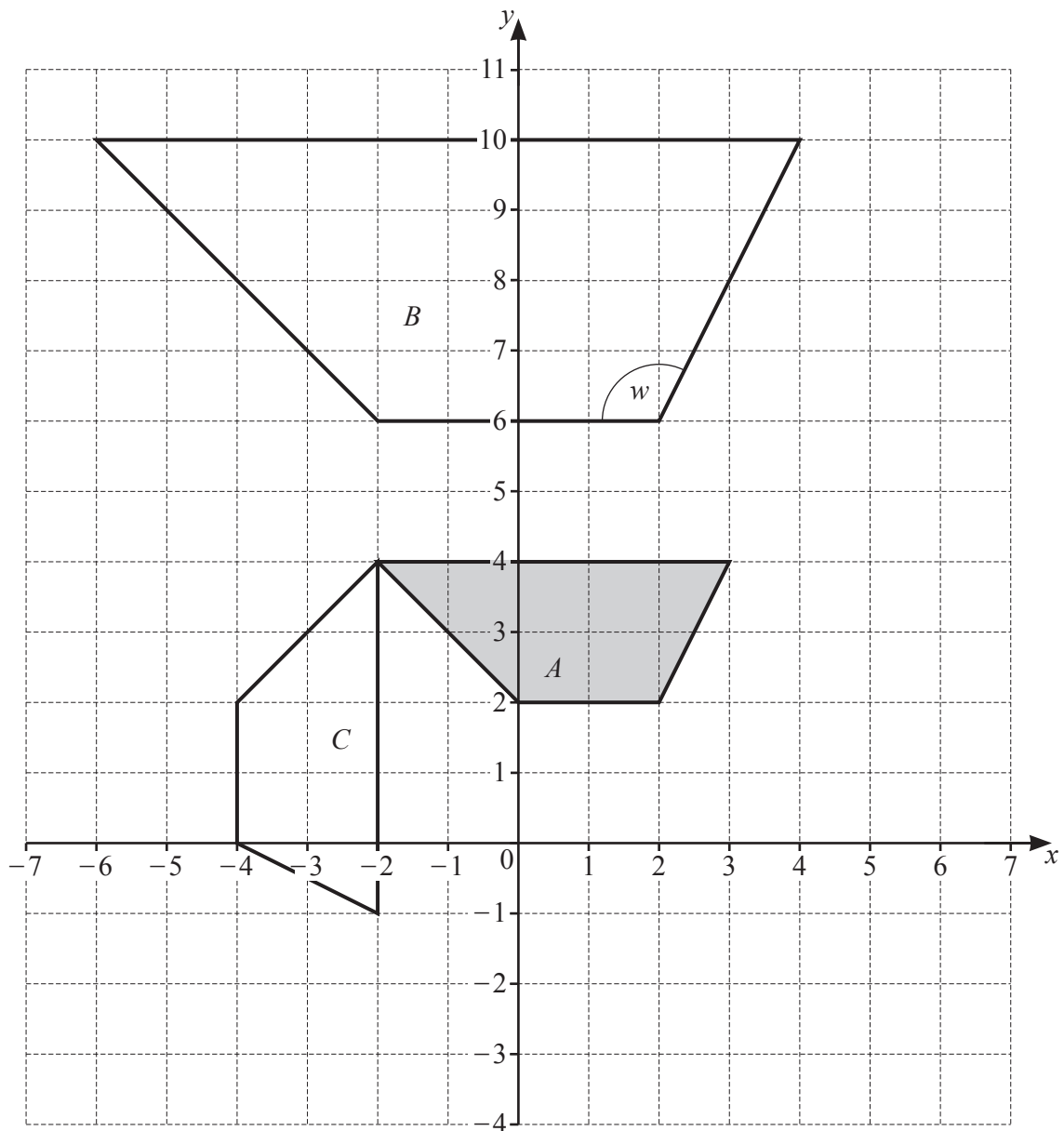
- (ii) Work out the value of  $y$ .  
Give a geometrical reason for your answer.

$y = \dots\dots\dots$  because  $\dots\dots\dots$   
 $\dots\dots\dots$  [3]

- (iii) Find the ratio  $x : y$ .  
Give your answer in its simplest form.

$\dots\dots\dots : \dots\dots\dots$  [1]

- 3 (a) The diagram shows three quadrilaterals,  $A$ ,  $B$  and  $C$ , on a  $1\text{ cm}^2$  grid.



- (i) (a) Write down the mathematical name for quadrilateral  $B$ .

..... [1]

- (b) Work out the area of quadrilateral  $B$ .  
Give the units of your answer.

..... [3]

- (ii) Measure angle  $w$ .

Angle  $w =$  ..... [1]

(iii) Describe fully the **single** transformation that maps

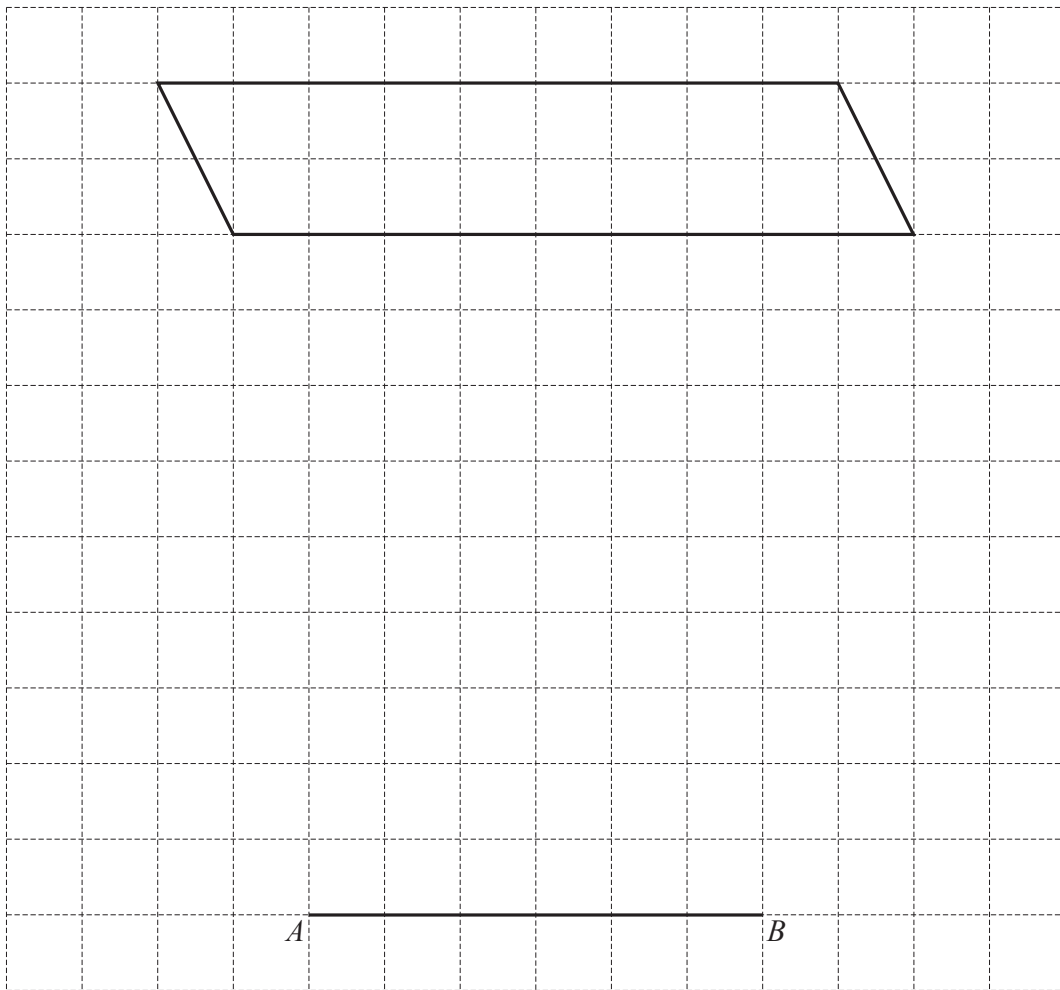
(a) quadrilateral  $A$  onto quadrilateral  $B$ ,

.....  
 ..... [3]

(b) quadrilateral  $A$  onto quadrilateral  $C$ .

.....  
 ..... [3]

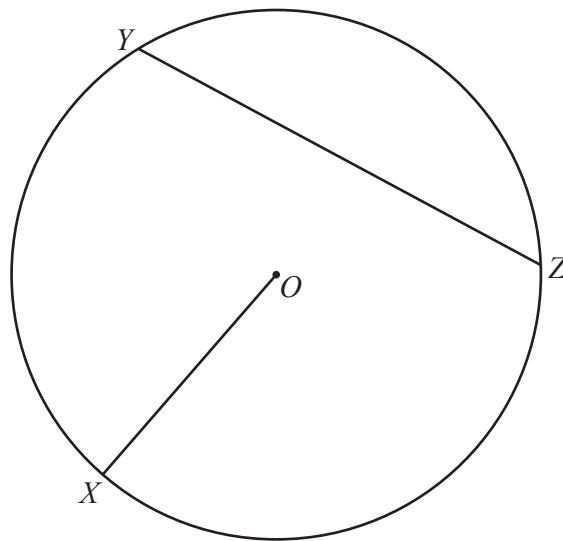
(b) The diagram shows a parallelogram and a line  $AB$  on a  $1\text{cm}^2$  grid.



On the grid, complete a triangle,  $ABC$ , that has the same area as the parallelogram.

[2]

4 (a)



$X$ ,  $Y$  and  $Z$  lie on a circle, centre  $O$ .

(i) Write down the mathematical name of the line

(a)  $OX$ ,

..... [1]

(b)  $YZ$ .

..... [1]

(ii) Measure the length of  $OX$ .

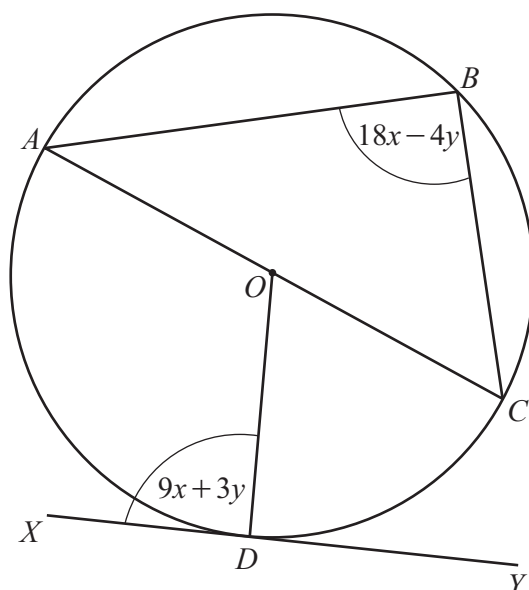
..... cm [1]

(b) Another circle has a radius of 18 cm.

Calculate the circumference of this circle.

..... cm [2]

(c) In this part, all angles are in degrees.



NOT TO  
SCALE

$A, B, C$  and  $D$  lie on a circle, centre  $O$ , diameter  $AC$ .  
 $XY$  is a tangent to the circle at  $D$ .

(i) Use the information in the diagram to complete these two simultaneous equations.

$$9x + 3y = \dots\dots\dots$$

$$18x - 4y = \dots\dots\dots$$

[2]

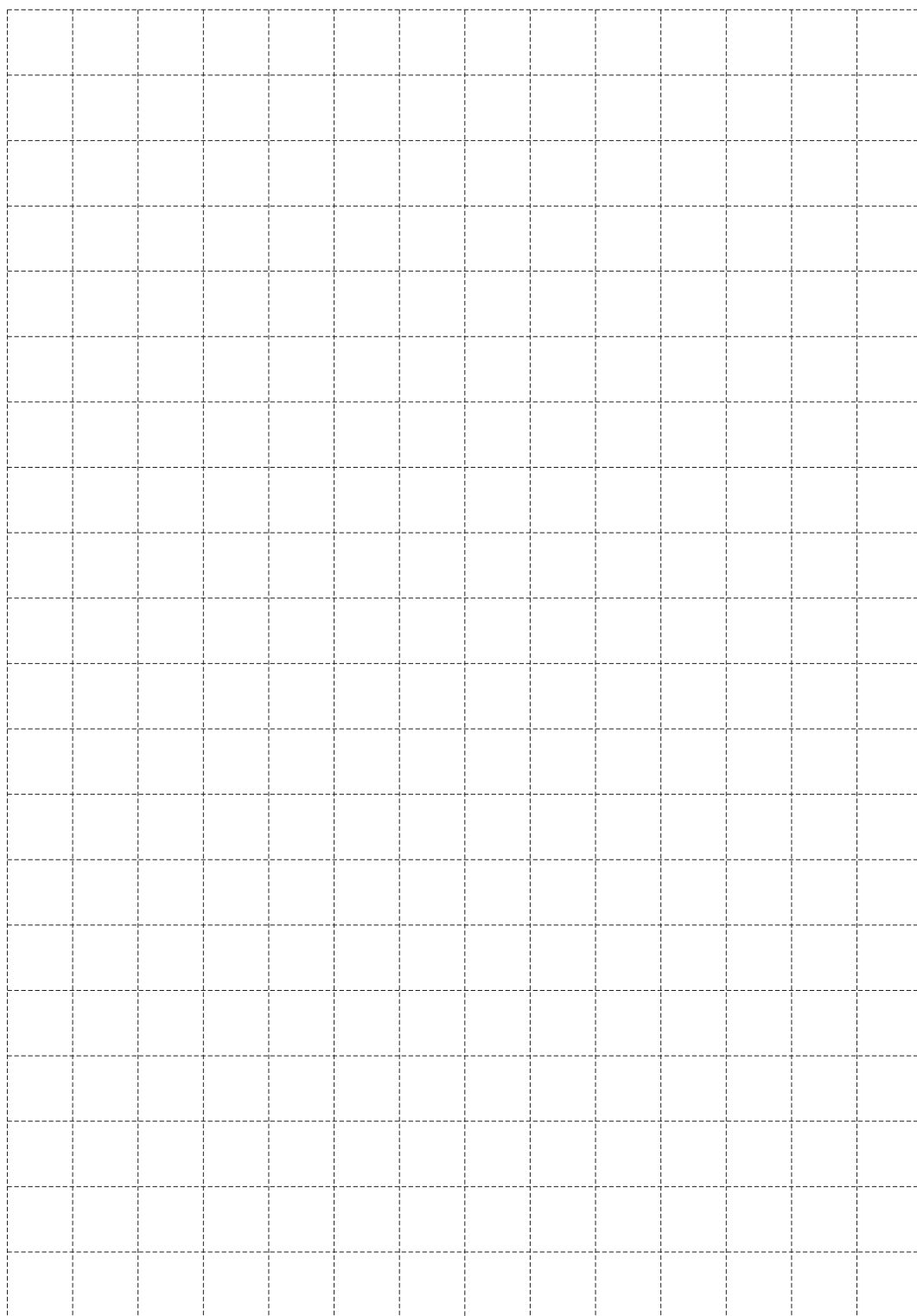
(ii) Solve your simultaneous equations.  
You must show all your working.

$$x = \dots\dots\dots$$

$$y = \dots\dots\dots [3]$$

5 (a) A closed box, in the shape of a cuboid, has length 5 cm, width 4 cm and height 2 cm.

(i) Draw a net of the box on the  $1\text{cm}^2$  grid.



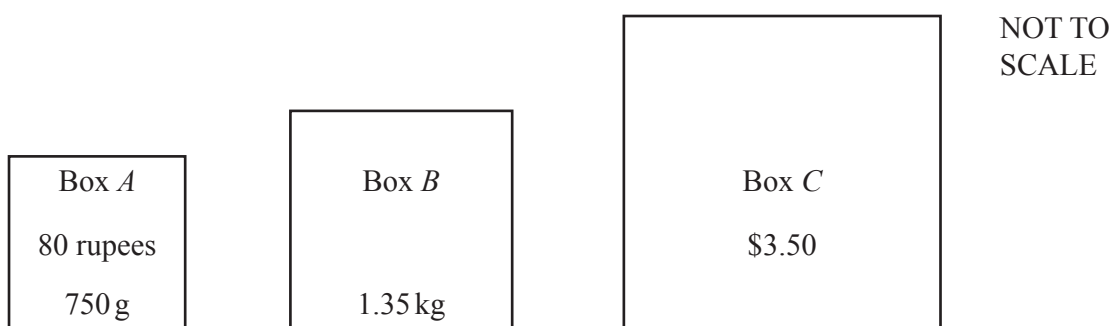
[3]

- (ii) A container is a cube with volume  $1\text{ m}^3$ .

Work out the maximum number of these boxes that can be packed into this container.

..... [3]

- (b) A shop sells three different sized boxes of rice.  
The boxes all have the same cost per kilogram.



- (i) Work out the cost in rupees of box B.

..... rupees [2]

- (ii) \$1 = 64 rupees.

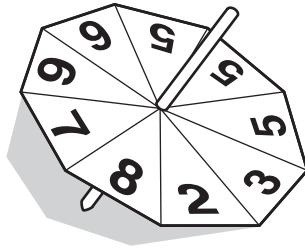
Calculate the mass of box C.  
Give your answer in kilograms.

..... kg [3]

- (c) Change  $75\text{ cm}^3$  into litres.  
Give your answer in standard form.

..... litres [2]

6 (a)



The diagram shows a fair 9-sided spinner.  
The numbers on the spinner are 2, 3, 5, 5, 5, 6, 6, 7 and 8.

(i) The spinner is spun once.

Write down the probability that the spinner lands on

(a) the number 8,

..... [1]

(b) a number less than 7.

..... [1]

(ii) The spinner is spun 135 times.

Work out the expected number of times the spinner lands on the number 6.

..... [1]

- (b) Hitesh throws a dice 80 times.  
The results are shown in the table.

| Number thrown | Frequency |
|---------------|-----------|
| 1             | 15        |
| 2             | 16        |
| 3             | 14        |
| 4             | 11        |
| 5             | 9         |
| 6             | 15        |

- (i) Write down the mode.

..... [1]

- (ii) Work out the range.

..... [1]

- (iii) Work out the median.

..... [1]

- (iv) Calculate the mean.

..... [3]

- 7 (a) 1 mile = 1.609344 kilometres

Change 6 miles into **metres**.

Give your answer correct to the nearest metre.

..... m [3]

- (b) (i) The bearing of a boat from a harbour is  $322^\circ$ .

Work out the bearing of the harbour from the boat.

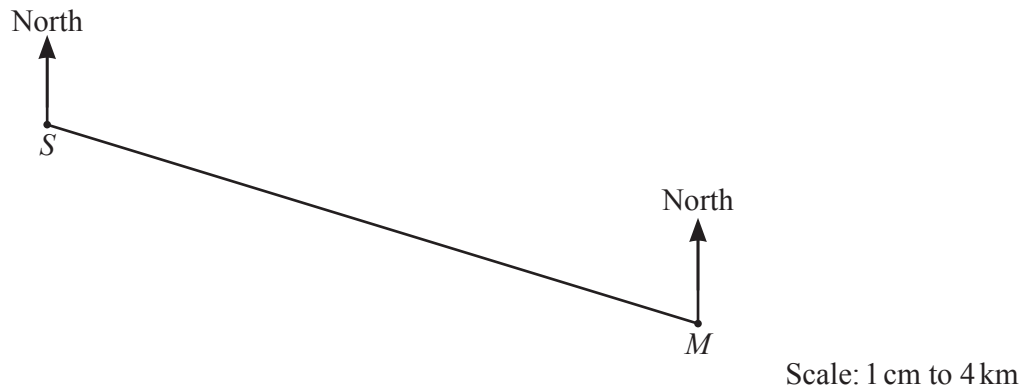
..... [2]

- (ii) The boat is 12 km from the harbour.  
At 2.30 pm the boat starts to sail to the harbour.  
The speed of the boat is 5 km/h.

Work out the time the boat arrives at the harbour.

..... [3]

- (c) The scale drawing shows the positions of Shakti's house,  $S$ , and Mairi's house,  $M$ , on a map. The scale is 1 cm represents 4 km.



- (i) Measure the bearing of  $M$  from  $S$ .

..... [1]

- (ii)



Scale: 1 cm to 5 km

This scale drawing shows another map with Shakti's house,  $S$ , marked on it. The scale of this map is 1 cm represents 5 km.

Mark the position of Mairi's house,  $M$ , on this map.

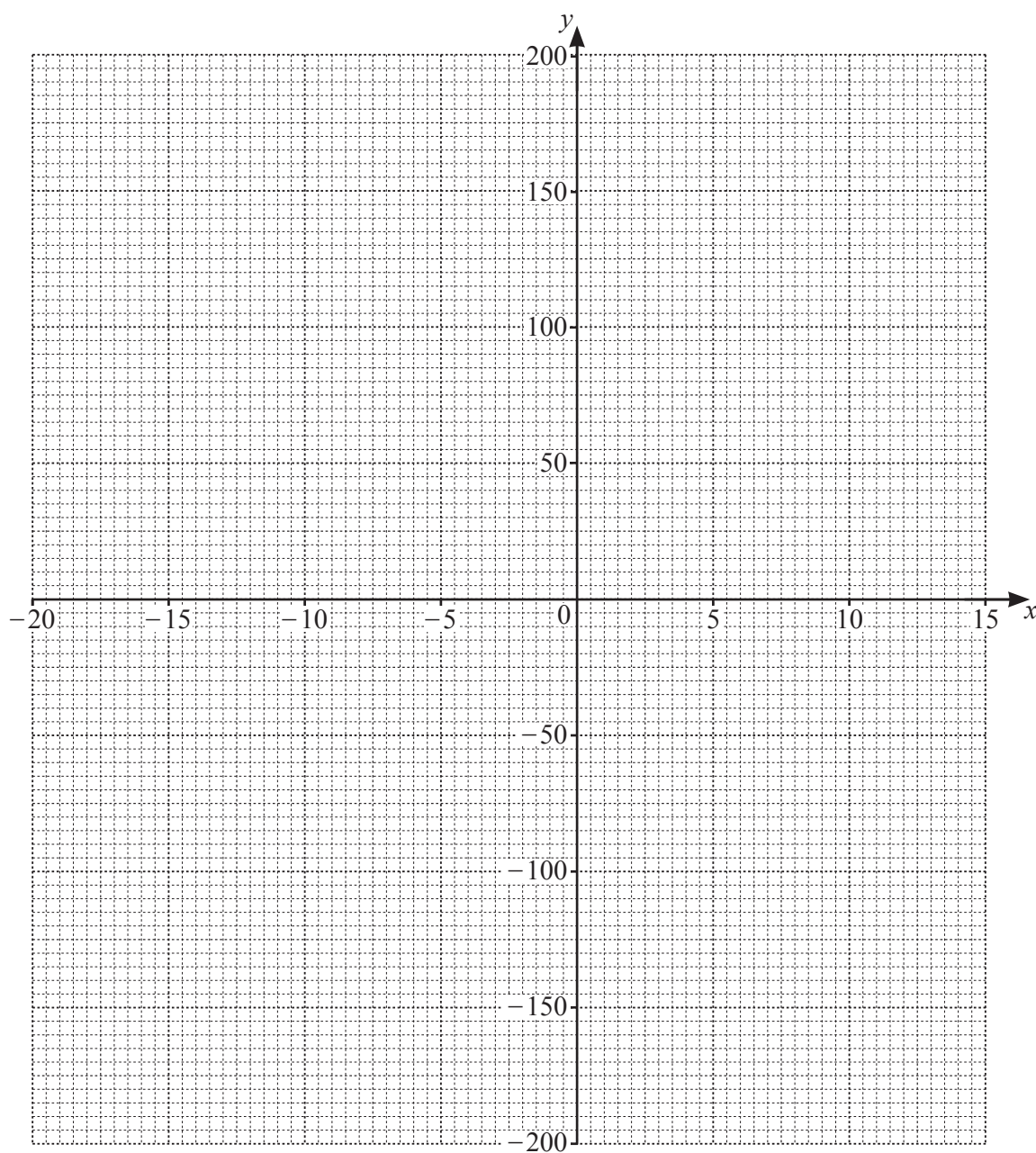
[4]

- 8 (a) (i) Complete the table of values for  $y = x^2 + 6x - 160$ .

|     |     |     |      |      |      |      |    |    |
|-----|-----|-----|------|------|------|------|----|----|
| $x$ | -20 | -15 | -10  | -5   | 0    | 5    | 10 | 15 |
| $y$ | 120 |     | -120 | -165 | -160 | -105 |    |    |

[3]

- (ii) On the grid, draw the graph of  $y = x^2 + 6x - 160$  for  $-20 \leq x \leq 15$ .



[4]

- (iii) (a) Write down the equation of the line of symmetry of the graph.

..... [1]

- (b) Find the coordinates of the lowest point on the graph.

( ..... , ..... ) [1]

- (iv) Use your graph to solve the equation  $x^2 + 6x - 160 = 0$ .

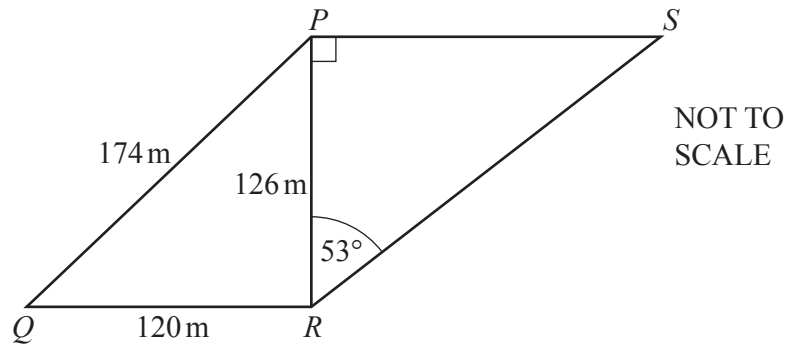
$x = \dots\dots\dots$  or  $x = \dots\dots\dots$  [2]

- (b) Rearrange the formula  $y = mx + c$  to make  $x$  the subject.

$x = \dots\dots\dots$  [2]

- 9 Tarak has two fields.  
He grows wheat, barley and corn in his fields.

(a)



The diagram shows Tarak's two triangular fields,  $PQR$  and  $PRS$ .  
Angle  $\angle RPS = 90^\circ$  and angle  $\angle PRS = 53^\circ$ .  
 $PQ = 174\text{ m}$ ,  $QR = 120\text{ m}$  and  $PR = 126\text{ m}$ .

- (i) Show that angle  $\angle PRQ = 90^\circ$ .

[2]

- (ii) Calculate the area of the quadrilateral  $PQRS$ .  
Give your answer correct to 4 significant figures.

.....  $\text{m}^2$  [5]

- (b) (i) The mass,  $m$  tonnes, of wheat grown in 2021 is 4.3 tonnes, correct to 1 decimal place.

Complete this statement about the value of  $m$ .

.....  $\leq m <$  ..... [2]

- (ii) In 2020, 2.6 tonnes of barley is grown.  
In 2021, 3.25 tonnes of barley is grown.

Show that the percentage increase in barley grown from 2020 to 2021 is 25%.

[1]

- (iii) In 2019, 2.4 tonnes of corn is grown.  
In 2020, 20% more corn is grown than in 2019.  
In 2021, 20% less corn is grown than in 2020.

Calculate the amount of corn grown in 2021.

..... tonnes [3]

**BLANK PAGE**

---

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.