Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
2025

Mathematics

StemUp Model Solution

Unit M1
(With calculator)

Foundation Tier

[GMC11]



GMC11

THURSDAY 15 MAY, 9.15am – 11.00am

TIME

1 hour 45 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
You must answer the questions in the spaces provided.
Do not write outside the boxed area on each page or on blank pages.
Complete in black ink only. **Do not write with a gel pen.**
Questions which require drawing or sketching should be completed using an HB pencil.
All working **must** be clearly shown in the spaces provided. Marks may be awarded for partially correct solutions.
You **may** use a calculator for this paper.
Answer **all twenty-eight** questions.

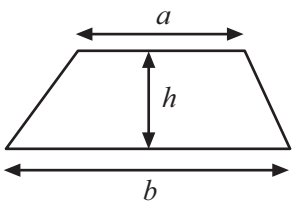
INFORMATION FOR CANDIDATES

The total mark for this paper is 100.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
You should have a calculator, ruler, compasses and a protractor.
The Formula Sheet is on page 2.

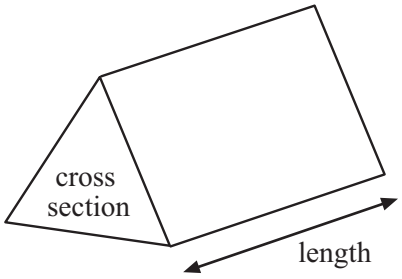
15851

Formula Sheet

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



Volume of prism = area of cross section × length



15851

1 Fill in the missing amounts to make the calculations correct.

(a) £1.84 + 38p = £ [2.22] [1]

(b) £4.30 + £ [2.90] = £7.20 [1]

(c) 7 × 63p = £ [4.41] [1]

(d) 15 × £ [0.80] = £12 [1]

(a) 1.84 + 0.38 = 2.22
(b) 7.20 − 4.30 = 2.90
(c) 7 × 0.63 = 4.41
(d) 12 ÷ 15 = 0.8

[Turn over

2 The total cost of hiring a crane is calculated using the formula

Total cost (£) = (daily charge × number of days hire) + number of delivery miles

The daily charge is £95

Joe hires the crane for 4 days with 14 delivery miles.

What is the total cost?

Total cost = 95 × 4 + 14
= 380 + 14
= 394

Answer £ 394 [2]

3 Which **two** of these values are equal to one quarter?

Circle your answers.

0.25 $\frac{20}{100}$ 75% $\frac{15}{60}$ 0.4

[2]

4 **(a)** The number 40 has 8 factors.

List these factors.

1 × 40, 2 × 20, 4 × 10, 5 × 8

1 2 4 5 8 10 20 40 [2]

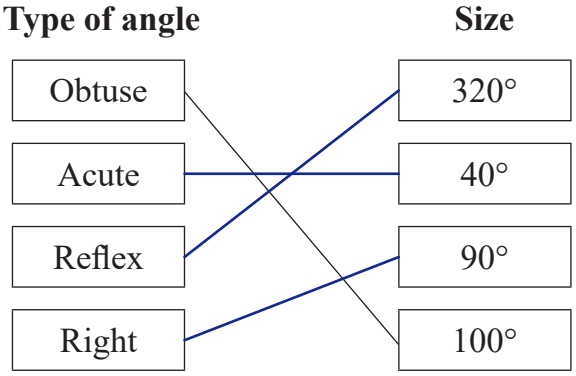
(b) Write down two square numbers which add to give a total of 40

Square numbers: 1, 4, 9, 16, 25, 36
36 + 4 = 40

Answer 36 and 4 [2]

5 Draw lines to match each type of angle to the correct size.

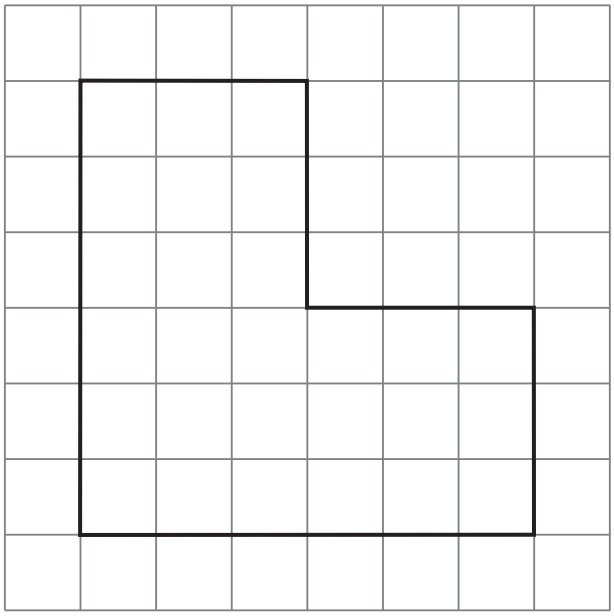
The first one has been done for you.



[3]

[Turn over

6 Look at this shape drawn on centimetre-squared paper.



(a) Work out the perimeter of the shape.

3 + 3 + 3 + 3 + 6 + 6 = 24

Answer 24 cm [1]

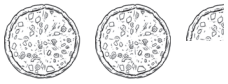
(b) Work out the area of the shape.

Big square 6 × 6 = 36
Missing square 3 × 3 = 9
36 − 9 = 27

Answer 27 cm^2 [2]

7 Pupils in a school were given pizza as a reward.

The pictogram shows information about how many pupils chose each type of pizza.

Type	Number of pupils
Ham & Cheese	
Pepperoni	
Hawaiian	
Margherita	
Spicy Chicken	

Key:  represents 4 pupils

(a) How many **more** pupils chose Margherita than Hawaiian?

Margherita = 9, Hawaiian = 7, 9 − 7 = 2

Answer *2* [1]

(b) 10 pupils chose Spicy Chicken.

Complete the pictogram to show this information. [1]

(c) How many pupils **in total** were given pizza?

12 + 22 + 7 + 9 + 10 = 60

Answer *60* [2]

[Turn over

8 The scores for 9 players in a competition are shown below.

26 29 19 21 22 18 29 28 31

(a) What is the **modal** score for the players?

Answer 29 [1]

(b) What is the **median** score for the players?

18 19 21 22 (26) 28 29 29 31

Answer 26 [2]

9 Show that $8 + 4 \times 5$ does not equal $(8 + 4) \times 5$

$8 + 4 \times 5 = 8 + 20 = 28$

$(8 + 4) \times 5 = 12 \times 5 = 60$

$28 \neq 60$, so $8 + 4 \times 5$ does not equal $(8 + 4) \times 5$

[2]

10 **(a)** Hamilton ran around a race track in 43.812 seconds.

Round this time to 1 decimal place.

Answer 43.8 seconds [1]

(b) Write down the place value of the 4 in the number 7 654 321

Answer 4000 (4 thousand) [1]

(c) Write these numbers in order from largest to smallest.

0.605 **0.6** **0.61**

0.605, 0.600, 0.610

Answer 0.61, 0.605, 0.6 [1]

[Turn over

11



Ticket Prices

Adult (17+)	**£13.50**
Child (4–16 years old)	**£6.75**
Child (under 4 years old)	**Free**
Student	**£7.50**
Senior	**£5.45**
Carer	**Free**
Family day ticket (up to 2 adults and 4 children)	**£37.50**

(a) A student, a senior and a carer visit the zoo.

How much do they pay altogether for their tickets?

Student + Senior + Carer
= 7.50 + 5.45 + 0 = 12.95

Answer £ *12.95* [2]

(b) Mr and Mrs Foster and their four children aged 3, 7, 9 and 11 visit the zoo.

Mr Foster says they will save at least £10 if they buy a Family day ticket.

Do you agree with Mr Foster?

Show your working out clearly.

Adults: 2 × 13.50 = 27.00

Children aged 7, 9, 11: 3 × 6.75 = 20.25

Child aged 3 is free

Total = 27.00 + 20.25 = £47.25

Saving = 47.25 − 37.50 = £9.75

£9.75 is less than £10, so he does not save at least £10

Answer *No* [3]

[Turn over

12 **(a)** Sean has h hoodies.

Conor has 5 more hoodies than Sean.

Write down an expression, in terms of h, for the number of hoodies Conor has.

Answer $h + 5$ [1]

(b) Martha has the same number of hoodies as Sean and Conor have altogether.

Write down an expression, in terms of h, for the number of hoodies Martha has.

Give your answer in its **simplest** form.

$h + (h + 5)$

Answer $2h + 5$ [1]

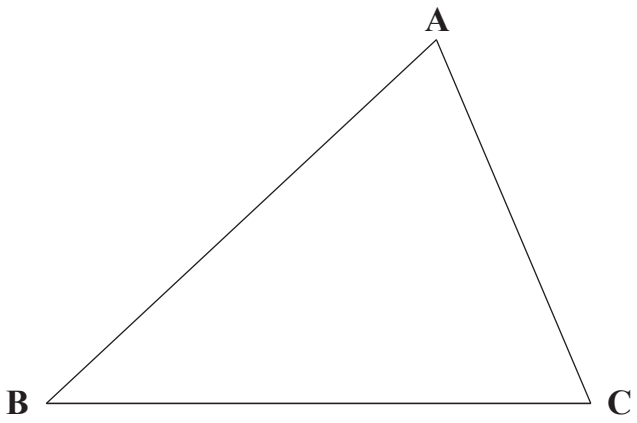
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(Questions continue overleaf)

[Turn over

13 A triangle ABC is drawn below.



(a) Using a protractor, measure the size of the angle at C.

Answer 67 ° [1]

(b) (i) Using a ruler, measure the length of the line BC in **centimetres**.

Answer 7.2 cm [1]

(ii) Write your answer to part **(b) (i)** in **millimetres**.

7.2 × 10 = 72

Answer 72 mm [1]

(c) Sam measured the angle at B as 137°

(i) Without measuring the angle, explain why Sam must be wrong.

The angle at B is acute (less than 90°) but 137° is obtuse,

so 137° is far too big. [1]

(ii) Now measure the angle.

What mistake did Sam make when he measured the angle?

Angle B is 43°. He read the wrong scale on the protractor

(the outer scale), giving 180 − 43 = 137°. [1]

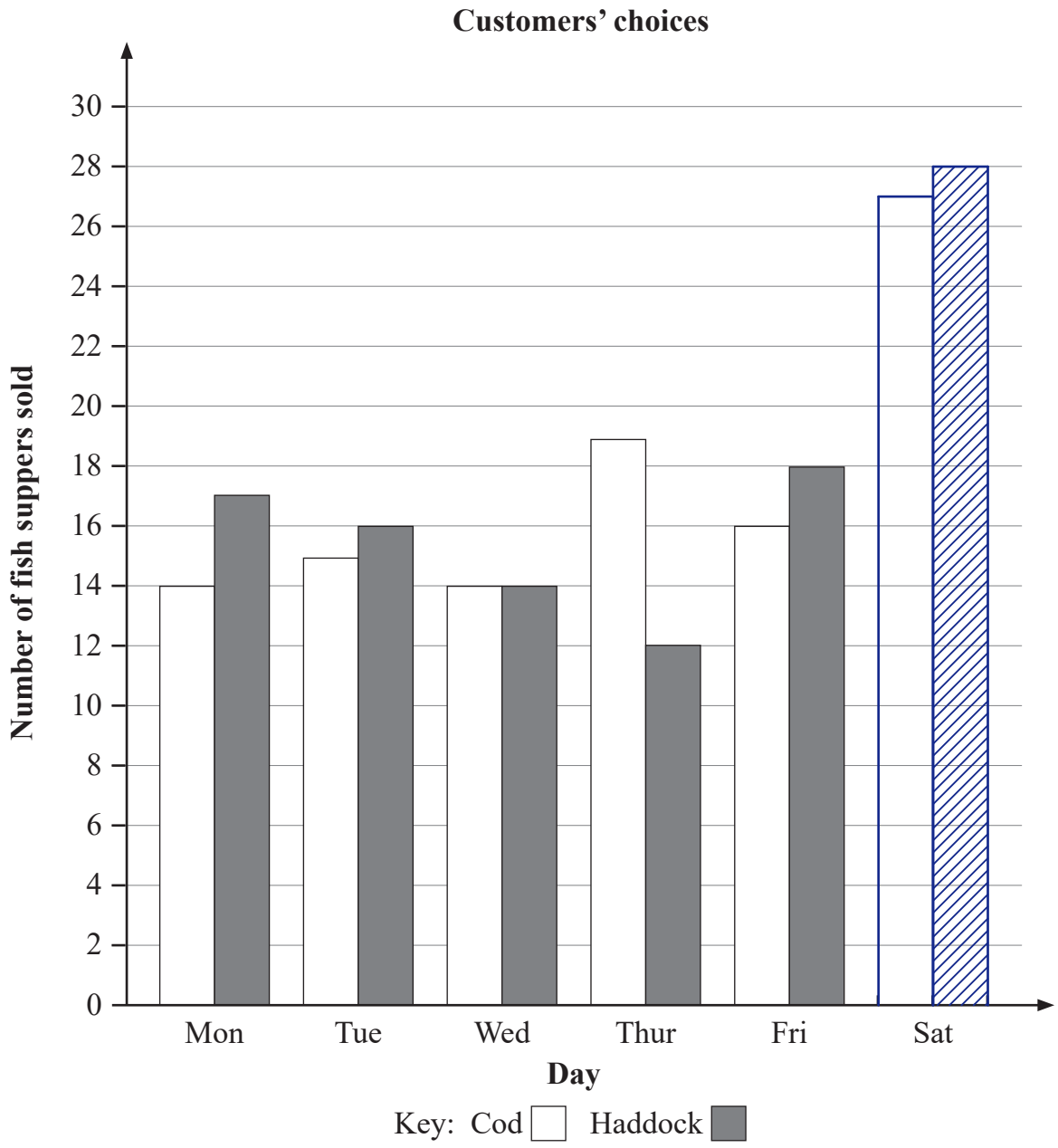
[Turn over

14 A local chippy sells fish suppers.

Customers can choose whether to have cod or haddock in their fish supper.

Each day for a week, the owner recorded the customers' choices.

The results are displayed in this dual bar chart.



15851

(a) On which day, from Monday to Friday, were most fish suppers sold?

Mon 14 + 17 = 31 Tue 15 + 16 = 31 Wed 14 + 14 = 28
Thur 19 + 12 = 31 Fri 16 + 18 = 34

Answer Friday [1]

(b) The owner thinks that, from Monday to Friday, he sold more haddock than cod.

Is he correct? Explain your answer clearly.

Cod: 14 + 15 + 14 + 19 + 16 = 78
Haddock: 17 + 16 + 14 + 12 + 18 = 77

Answer No because he sold 78 cod and only 77 haddock, so he sold more cod than haddock. [2]

(c) On Saturday, 27 cod suppers were sold.

Overall, from Monday to Saturday, the same number of cod suppers and haddock suppers were sold.

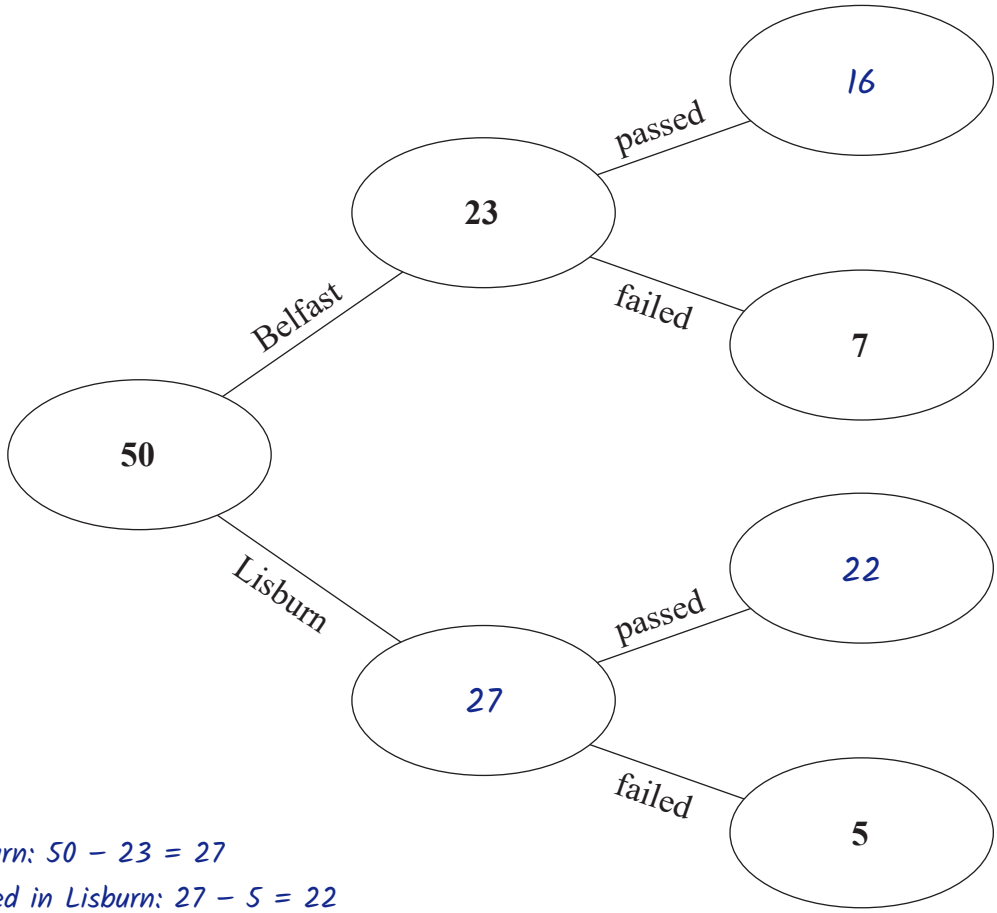
Complete the bar chart. [2]

Cod total = 78 + 27 = 105, Haddock on Sat = 105 − 77 = 28

[Turn over

15 50 people booked an MOT test in either Belfast or Lisburn.

Some of the results are shown in the frequency tree below.



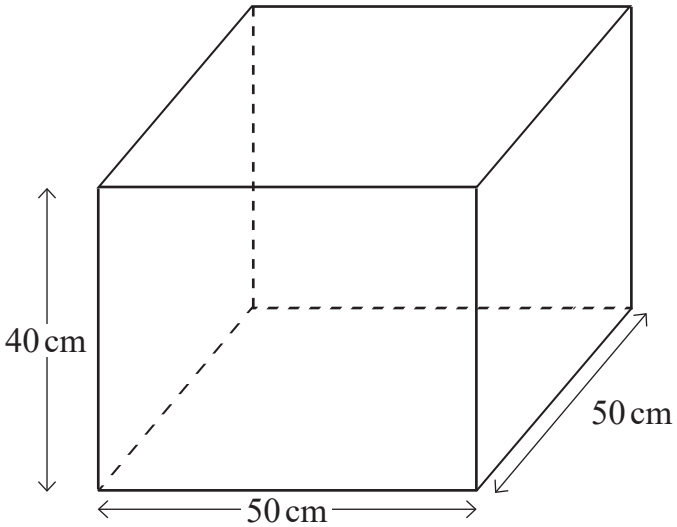
Lisburn: 50 − 23 = 27

Passed in Lisburn: 27 − 5 = 22

How many MOT tests were passed in Lisburn?

Answer 22 [2]

16 A container, in the shape of a cuboid, has dimensions as shown in the diagram.



(a) What is the **volume** of the container?

Volume = 50 × 50 × 40
= 100 000

Answer 100 000 cm^3 [2]

(b) 60 litres of liquid are poured into the container.

How deep will the liquid be?

60 litres = 60 000 cm^3
Area of base = 50 × 50 = 2500 cm^2
Depth = 60 000 ÷ 2500 = 24

Answer 24 cm [3]

[Turn over

17 Engine oil costs £14.80 per litre.

Jason buys 6.5 litres of engine oil.

He also buys 5 identical spark plugs.

The total cost is £113

How much does each spark plug cost?

Oil: 6.5 × 14.80 = £96.20

Spark plugs: 113 − 96.20 = £16.80

Each plug: 16.80 ÷ 5 = £3.36

Answer £ 3.36 [3]

18 At the start of the year, Sue's caravan was worth £9 600

By the end of the year, Sue's caravan had lost 26% of its value.

At the start of the year, John's caravan was worth £9 975

By the end of the year, John's caravan had lost $\frac{2}{7}$ of its value.

Whose caravan was worth more by the end of the year and by how much more?

Sue: 26% of 9600 = 9600 ÷ 100 × 26 = 2496

9600 − 2496 = £7104

John: 2/7 of 9975 = 9975 ÷ 7 × 2 = 2850

9975 − 2850 = £7125

7125 − 7104 = 21

Answer John by £ 21 [5]

[Turn over

19 **(a)** Simplify $4c + 5d + c - 7d$

$4c + c = 5c, \quad 5d - 7d = -2d$

Answer $5c - 2d$ [2]

(b) Expand $5(2t + 5)$

Answer $10t + 25$ [1]

20

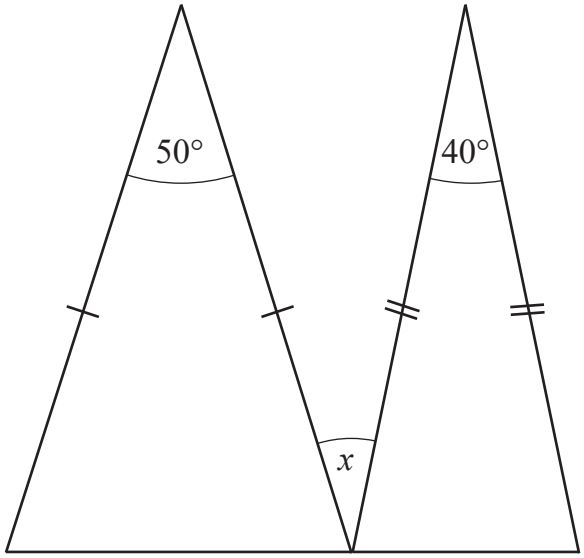


diagram not drawn accurately

Calculate the size of the angle marked x

Left triangle is isosceles: base angles = (180 − 50) ÷ 2 = 65°

Right triangle is isosceles: base angles = (180 − 40) ÷ 2 = 70°

Angles on a straight line add to 180°:

x = 180 − (65 + 70) = 45°

Answer 45 ° [3]

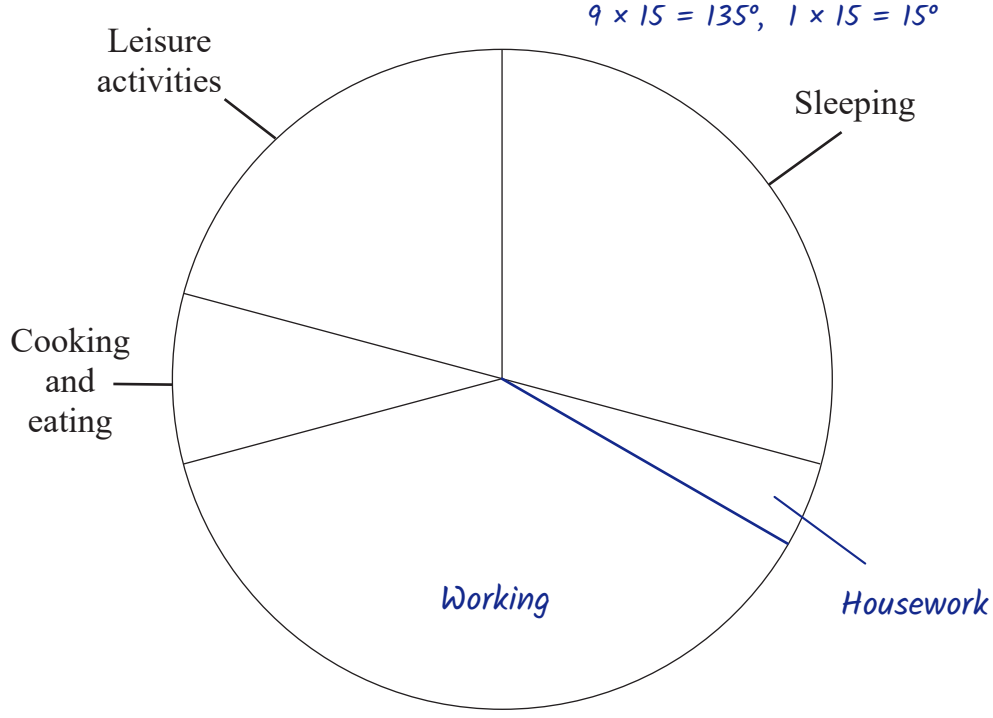
[Turn over

21 Philip wanted to draw a pie chart to display the results of a study on how adults spend their time each day.

He used the information in the table to start drawing the pie chart.

Activity	No. of hours	Angle
Sleeping	7	105°
Leisure activities	5	75°
Cooking and eating	2	30°
Working	9	135°
Housework	1	15°
Total	**24**	**360°**

360 ÷ 24 = 15° per hour
9 × 15 = 135°, 1 × 15 = 15°



(a) Complete the table. [2]

(b) Complete the pie chart. [2]

(c) Philip says, "The angle for leisure activities is 75°. This means adults spend 75% of their time on leisure activities."

Is Philip correct? Explain your answer clearly.

No. The angle is 75 out of 360, but 75% means 75 out of 100.

75 ÷ 360 × 100 = 20.8%, so only about 21% of their time. [2]

22 What is the difference in size between the largest and smallest of these numbers?

$$2 \qquad 2\frac{1}{2} \qquad 0.02 \qquad \frac{2}{10}$$

Show your working out clearly.

$2 = 2$, $2\frac{1}{2} = 2.5$, $0.02 = 0.02$, $\frac{2}{10} = 0.2$

Largest = 2.5, smallest = 0.02

2.5 − 0.02 = 2.48

Answer 2.48 [3]

[Turn over

23 Last season 103 750 people watched the Belfast Giants.

This season 8300 more people watched.

What was the percentage increase?

Percentage increase = 8300 ÷ 103 750 × 100
= 8

Answer *8* % [2]

24 A charity holds a collection day.

During the collection day, 200 notes are donated to the charity.

25% of the notes are £10 notes.

$\frac{3}{5}$ of the notes are £5 notes.

There are eighteen £20 notes.

The rest of the notes are £50 notes.

What is the total value of all the notes donated?

Show your working out clearly.

£10 notes: 25% of 200 = 50, 50 × £10 = £500

£5 notes: 3/5 of 200 = 120, 120 × £5 = £600

£20 notes: 18 × £20 = £360

£50 notes: 200 − 50 − 120 − 18 = 12, 12 × £50 = £600

Total = 500 + 600 + 360 + 600 = £2060

Answer £2060 [4]

[Turn over

25 A school has 540 pupils.

45% of the pupils live 2 miles or less from the school.

$\frac{2}{3}$ of the pupils who live more than 2 miles from the school travel by bus.

How many pupils who live more than 2 miles from the school travel by bus?

45% of 540 = 0.45 × 540 = 243

More than 2 miles: 540 − 243 = 297

$\frac{2}{3}$ × 297 = 198

Answer 198 [3]

26 Solve $3(y - 7) = 18$

3y − 21 = 18

3y = 39

y = 13

Answer $y =$ 13 [3]

15851

27 Mia asked each person in her class how many devices they owned that could connect to the internet.

She recorded the results as follows.

3	2	2	1	4
1	1	3	4	2
2	2	3	3	2
4	3	1	2	2

(a) Complete the frequency table below.

Number of devices	Number of pupils (frequency)	Total number of devices
1	4	4
2	8	16
3	5	15
4	3	12

[2]

(b) Calculate the mean number of devices per pupil.

Total pupils = 4 + 8 + 5 + 3 = 20
Total devices = 4 + 16 + 15 + 12 = 47
Mean = 47 ÷ 20 = 2.35

Answer 2.35 [2]

(c) What was the range of the number of devices?

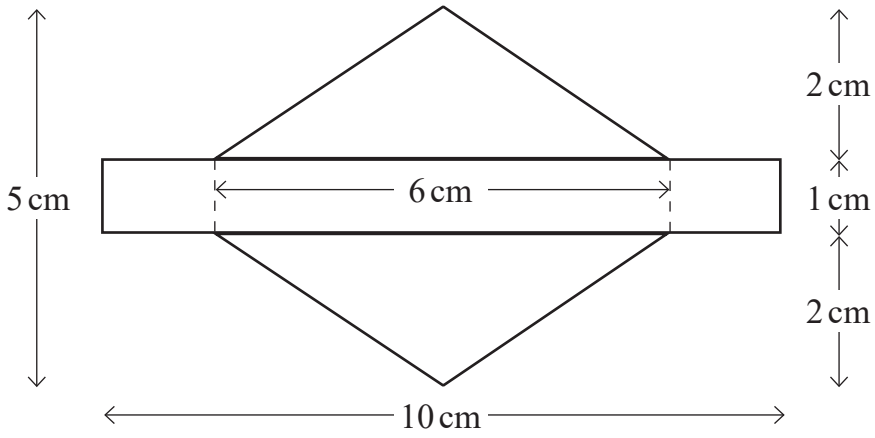
4 − 1 = 3

Answer 3 [1]

[Turn over

28 A badge is in the shape of two identical triangles and a rectangle, as shown in the diagram.

diagram not drawn accurately



The badges are cut from a square sheet of metal, of side 1 metre, in rows as shown.

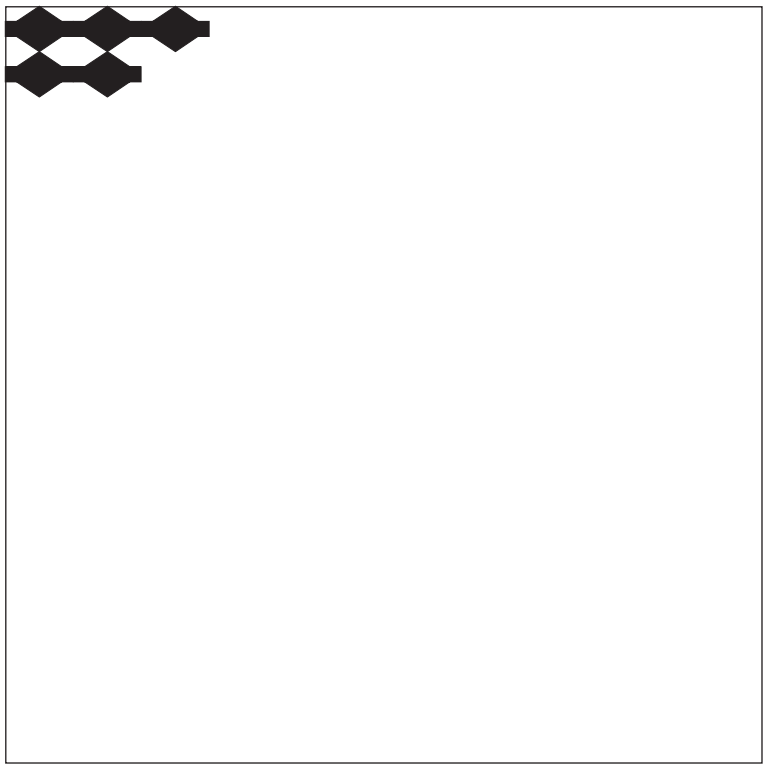


diagram not drawn accurately

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What is the total **area** of the metal left over after the **maximum** number of badges have been cut from the sheet in rows as shown?

Area of one triangle = $6 \times 2 \div 2 = 6$ cm^2

Area of rectangle = $10 \times 1 = 10$ cm^2

Area of badge = $10 + 6 + 6 = 22$ cm^2

1 metre = 100 cm

Badges per row = $100 \div 10 = 10$

Number of rows = $100 \div 5 = 20$

Number of badges = $10 \times 20 = 200$

Total area of badges = $200 \times 22 = 4400$ cm^2

Area of sheet = $100 \times 100 = 10\,000$ cm^2

Left over = $10\,000 - 4400 = 5600$

Answer 5600 cm^2 [6]

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For Examiner's use only	
Question Number	**Marks**
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