New Specification

cea
Rewarding Learning

General Certificate of Secondary Education
January 2019

Mathematics

Unit M1
(With calculator)

Foundation Tier

[GMC11] *GMC11*

TUESDAY 8 JANUARY, 9.15am–11.00am

Centre Number

Candidate Number

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.**
Answer **all twenty-five** questions.
All working should be clearly shown in the spaces provided. Marks may be awarded for partially correct solutions.
You **may** use a calculator for this paper.

INFORMATION FOR CANDIDATES

Functional Mathematics is assessed in this unit.
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.
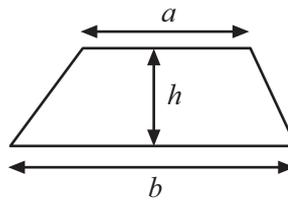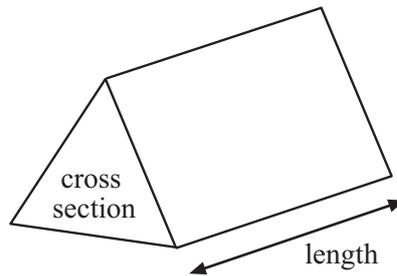The Formula Sheet is on page 2.

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36GMC1101

Formula Sheet

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

Volume of prism = area of cross section × length

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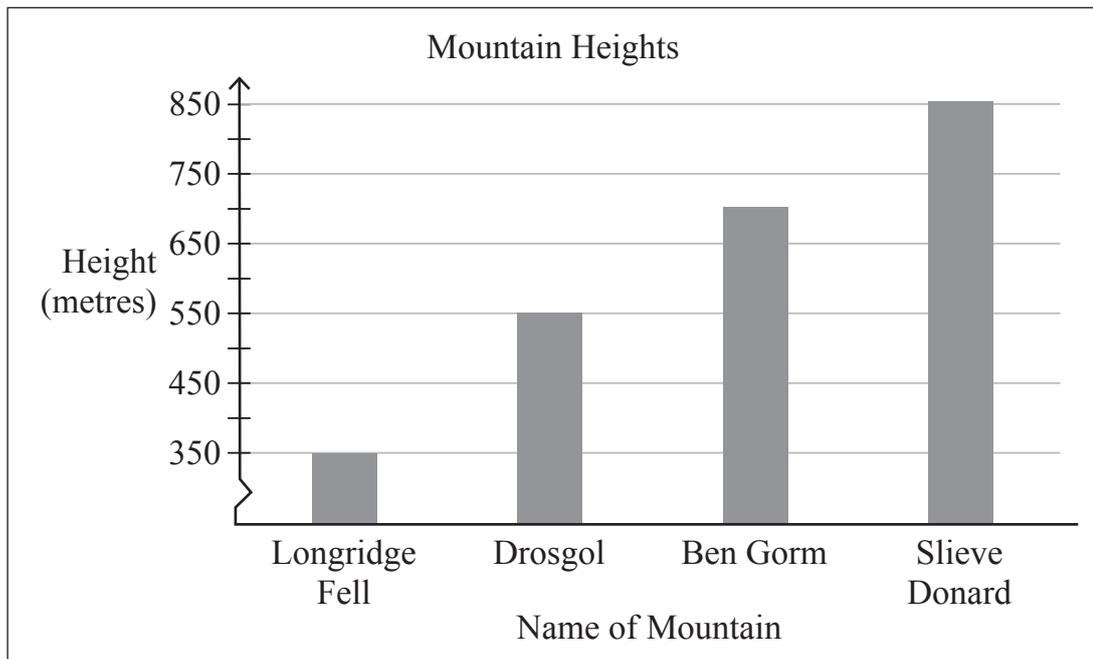**DO NOT WRITE ON THIS PAGE**

(Questions start overleaf)

1 Some mountain heights are shown.

Mountain Heights

(a) What height is Drosgol?   Answer _____ m [1]

(b) How much higher is Slieve Donard than Drosgol?

Answer _____ m [1]

(c) Joe says Ben Gorm is more than twice as high as Longridge Fell.

Mary says the height of Ben Gorm is exactly twice that of Longridge Fell.

Who is correct?

Give a reason for your answer.

Answer _____ because _____

_____ [2]

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36GMC1104

2 **(a)** Some metric units are shown in the box.

grams	cm^2	litres	kilograms	kilometres
centimetres	millilitres	m^2	metres	cm^3

Which unit is used to measure the

(i) amount of water in a bath,
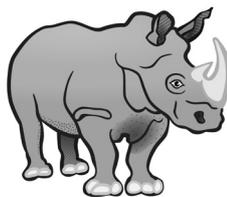
Answer _____ [1]

(ii) height of a tree,

Answer _____ [1]

(iii) area of a football pitch?

Answer _____ [1]

(b) The weight of a rhino is 2.4 tonnes.

How many kilograms is this?

Answer _____ kg [1]

[Turn over

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3 A car costing £11 985 is reduced by one third in a sale.

Sale price
$\frac{1}{3}$ off

(a) What is the sale price?

Answer £ _____ [2]

(b) The car needs new tyres.

The total cost of four tyres is £197.60

How much does each tyre cost?

Answer £ _____ [2]

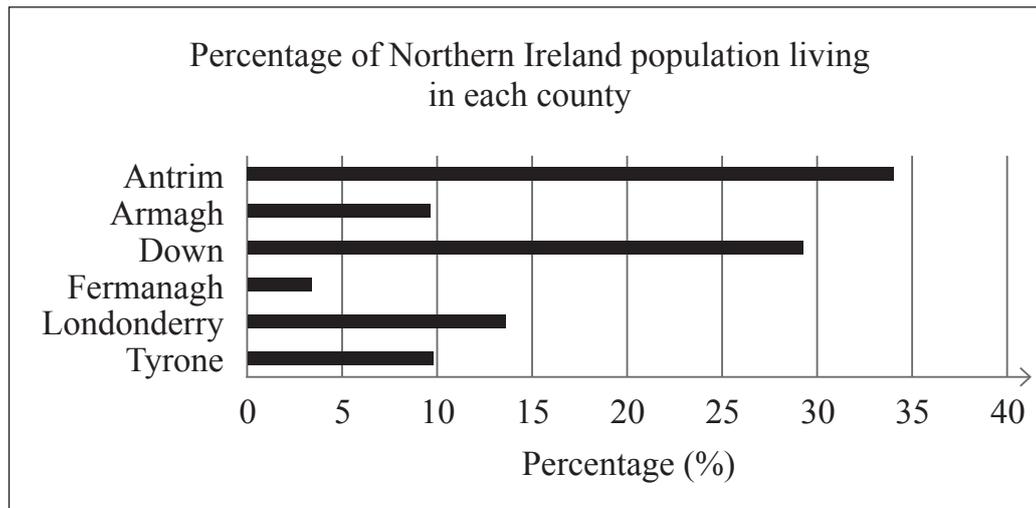**(c)** The car insurance is £307.65

Round this amount to the nearest £10

Answer £ _____ [1]

4   This chart shows the percentage breakdown of Northern Ireland's population by county.

Percentage of Northern Ireland population living
in each county

(a) Which county contains about 30% of the population?

Answer _____ [1]

(b) Luke makes a statement about the chart and Kate disagrees.

The chart shows that most people in Northern Ireland live in County Antrim

No it doesn't!

Who do you think is correct?

Explain your answer.

Answer _____ because _____

_____ [1]

[Turn over

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5 (a) There are 30 passengers on a bus.

18 of them are children.

What fraction of the passengers are **not** children?

Give your answer in its **lowest terms**.

Answer _____ [2]

(b) The bus fare is £1.80

Gerry has a "Save 10%" voucher.

How much does he save?

Answer _____ p [1]

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36GMC1108

(c) The bus has a 3-digit number.

Each digit is **different**.

The first digit is a multiple of 4

The second digit is a square number.

The third digit is a factor of 10
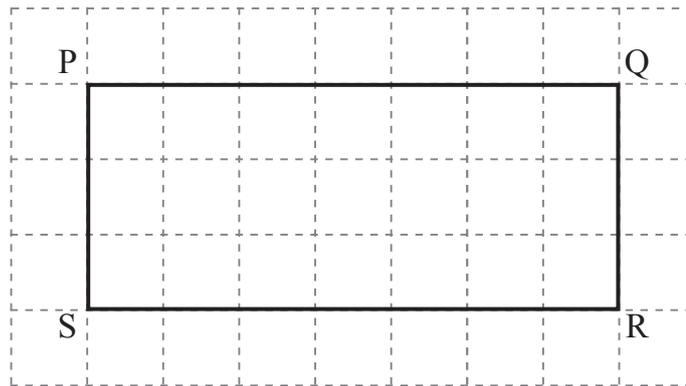
The sum of the three digits is 10

What is the bus number?

Answer _____ [2]

[Turn over

36GMC1109

6 **(a)** Rectangle PQRS is drawn on a centimetre grid.

P ⌐————————————⌐ Q

S └————————————┘ R

(i) What is the perimeter of the rectangle?

Answer _____ cm [1]

(ii) Name a pair of perpendicular sides in the rectangle.

Answer _____ and _____ [1]

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36GMC1110

(b)
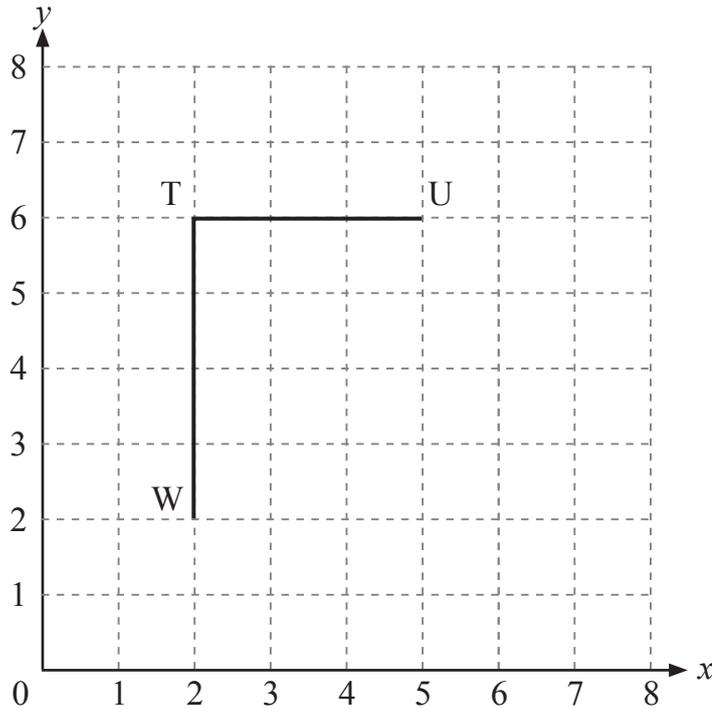
(i) What are the coordinates of U?

Answer (_____ , _____) [1]

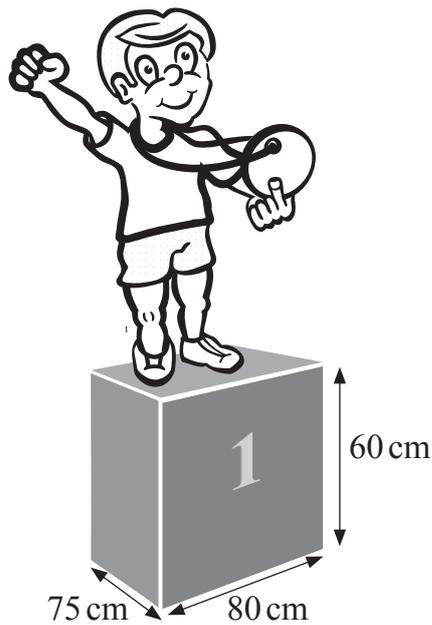**(ii)** Shape TUVW is a trapezium.

Side WV is **longer** than side TU.

Mark a possible vertex V on the grid and complete the drawing of
the trapezium. [1]

[Turn over

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36GMC1111

7 A winners' podium (a cuboid) is shown.

60 cm

75 cm   80 cm

(a) How many **vertices** has the podium?

Answer _____ vertices [1]

(b) What is the area of the **base** of the podium?

Answer _____ cm^2 [2]

(c) What is the volume, in **m^3**, of the podium?

Answer _____ m^3 [2]

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36GMC1112

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(Questions continue overleaf)

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8 Eight leaders and 143 members of a youth club go by bus to a bowling alley.

The Beezer Bus Company has buses for hire that hold 32 passengers each.

(a) How many buses will the youth club need to hire?

Answer _____ [3]

(b) How many spare seats will there be altogether?

Answer _____ [2]

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(c) Each bus costs £140 to hire.

The cost is split equally between the members.

The leaders do not pay.

How much does each member need to pay to cover the cost of hiring the buses?

Answer £ _____ [3]

[Turn over

11921

36GMC1115

9 The average monthly temperatures in Colorado during the ski season are shown below.

December	January	February	March	April
−14°C	−15°C	−13°C	−9°C	−5°C

(a) Which month was warmest?

Answer _____ [1]

(b) What was the difference in temperature between the warmest and coldest months?

Answer _____°C [1]

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36GMC1116

10 The hourly rates of pay for some jobs in a warehouse are shown below.

    Warehouse Associate   £8.07

    Warehouse Worker   £8.24

    Health and Safety Officer   £9.94

    Picker   £7.59

(a) Work out the mean of these four hourly rates.

Answer £_____ [3]

(b) What is the range of the hourly rates?

Answer £_____ [1]

[Turn over

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36GMC1117

11 Work out the size of the missing angle in each of the diagrams below.

(a)

diagram not
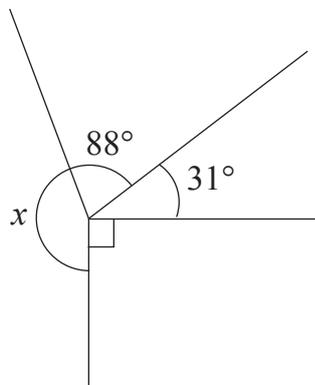drawn accurately

x 132°
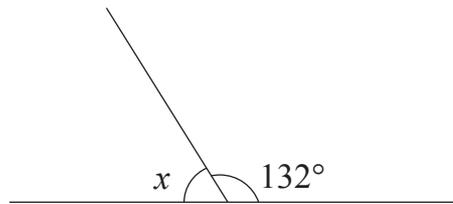
Answer $x =$ _____ ° [1]

(b)

diagram not
drawn accurately

88°

31°

x

Answer $x =$ _____ ° [1]

(c)

diagram not
drawn accurately

24°

x

Answer $x =$ _____ ° [1]

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36GMC1118
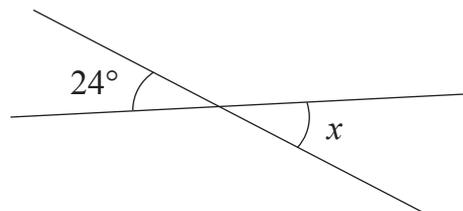
12 (a) Simplify $9a - 5a + 2a$

Answer _____ [1]

(b) Solve $4y = 60$

Answer $y =$ _____ [1]

(c) Solve $m - 4 = 9$

Answer $m =$ _____ [1]

13 Brian hired some equipment.

There was a fixed charge of £45 plus a hire fee of £13.50 per day.

He paid £274.50 in total.

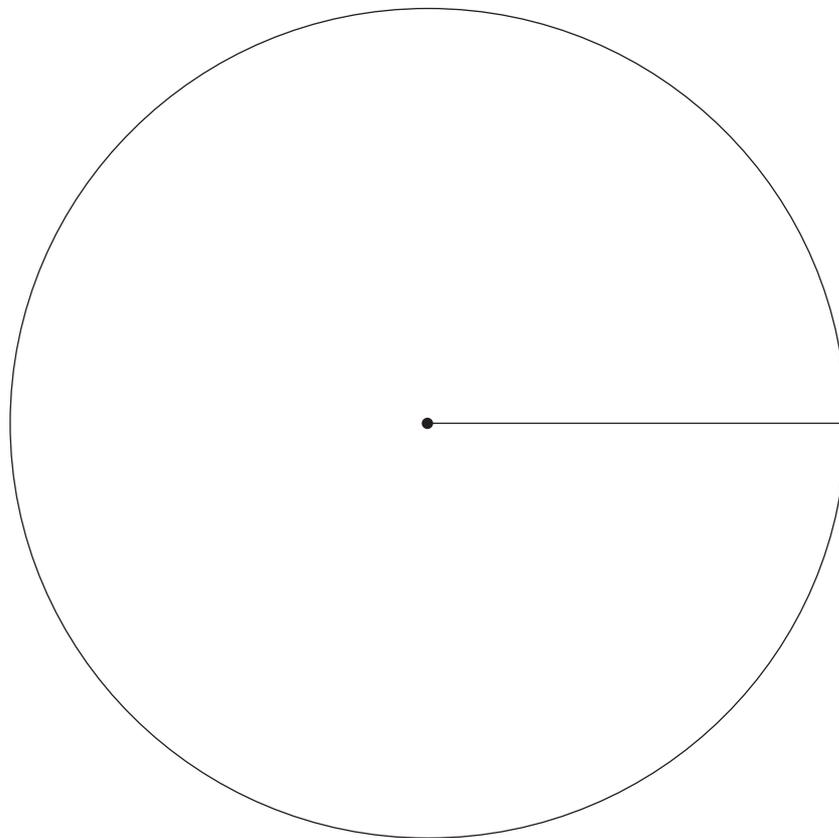How many days did he hire the equipment for?

Answer _____ [3]

[Turn over

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14 (a) Dodd's Ice Cream shop sold four sizes of ice cream tubs.

The owner wants to see a pie chart showing the numbers of tubs sold.

Size of tub	Number of tubs sold	Angle
Small	50	
Medium	34	
Large	24	
Family	12	

Draw a pie chart to show this information.

[4]

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(b) Complete the table to find the total number of scoops used.

Size of tub	Number of tubs sold	Number of scoops per tub	Number of scoops used
Small	50	1	50
Medium	34	2	68
Large	24	3	
Family	12	10	
		Total	

[2]

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15 (a) Place a digit from 1, 2, 3, 4, 5 in each box to make a true statement.

$$\boxed{} + \boxed{} \times \boxed{} = 21$$

[2]

(b) Insert brackets to make a true statement.

$$24 \div 6 - 4 = 12$$

[1]

16 (a) Complete the table below for $y = 5x - 4$

x	-2	-1	0	1	2	3	4
y	-14		-4	1		11	16

[1]

(b) On the grid below, draw the graph of $y = 5x - 4$

[2]

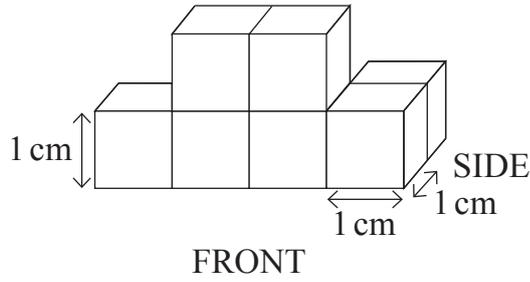**[Turn over**
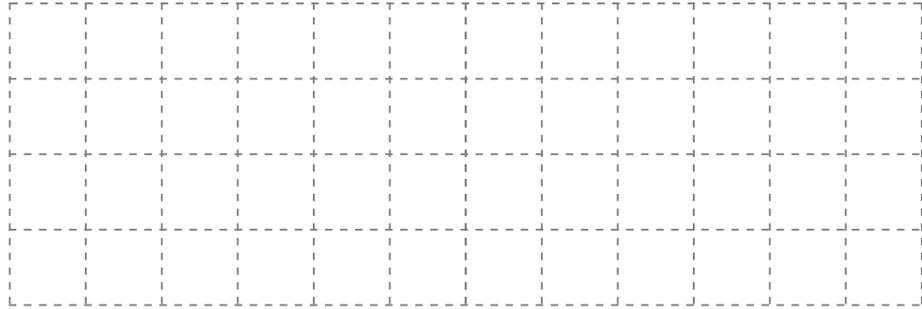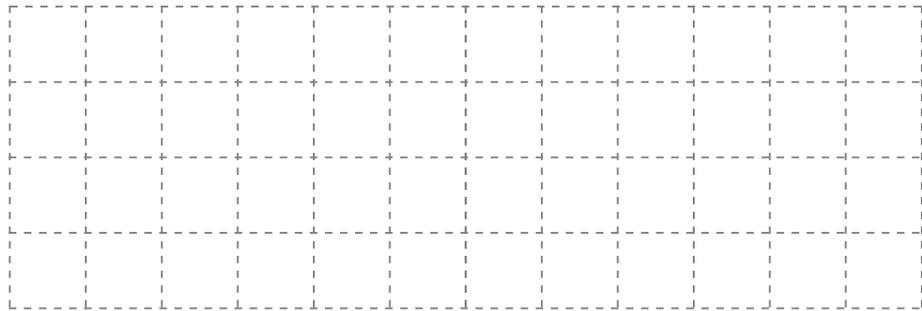
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17

1 cm

SIDE

1 cm

1 cm
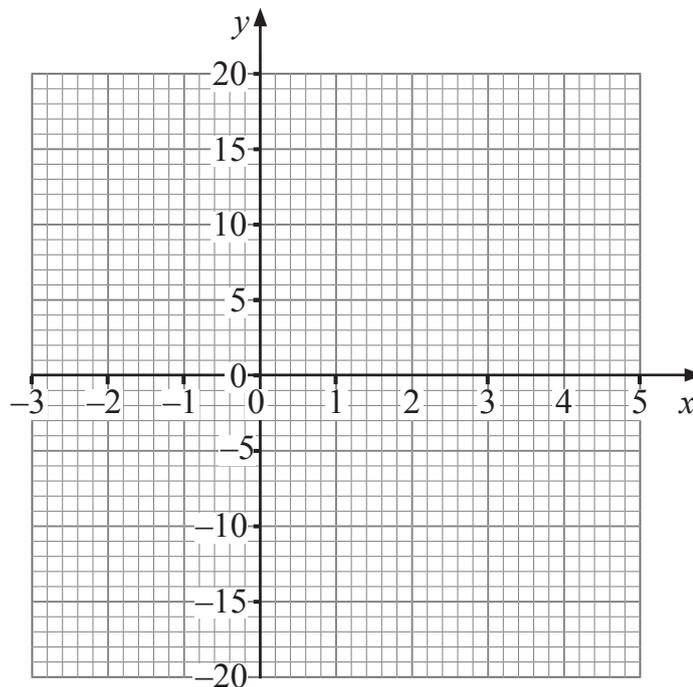
FRONT

Draw the front and side elevations on the grid below.

FRONT

SIDE

[3]

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18 Mary raised some money.

She gave $\frac{2}{5}$ of the money to a charity.

She gave $\frac{1}{4}$ of the money to a housing project.

She gave the rest of the money to a first aid group.

What **percentage** of the money did the first aid group receive?

Answer _____% [4]

[Turn over

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36GMC1125

19 The diagram below shows a rectangular garden with a circular pond in the centre.

6.5 m

Grass   Grass

1.2 m

3.2 m
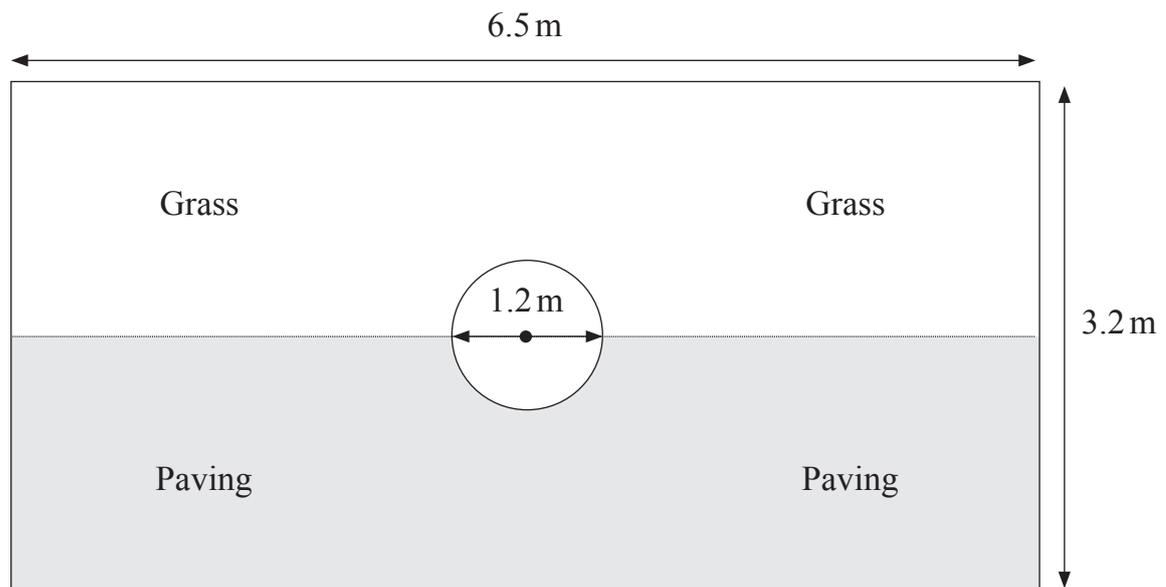
Paving   Paving

(a) Work out the area of the pond.

State the units of your answer.

Answer _____ [3]

36GMC1126

(b) Paving costs £30 per square metre.

It can only be bought in whole square metres.

How much will it cost to pave the section shown on the diagram?

Answer £_____ [4]

36GMC1127

20 Leah wants to check how economical her car is.

She travels 275 miles, using 22 litres of petrol.

(a) How many miles does her car travel per litre of petrol?

Answer _____ miles [1]

(b) The 275 mile journey took Leah 5 hours 30 minutes.

What was her average speed for the journey?

Answer _____ miles per hour [3]

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21 The price of a photocopier is reduced in a sale.

<div style="text-align: center">

COOL COPY

was £489

now 15% off

</div>

How much does it cost now?

Answer £ _____ [3]

22 Jayne owns a hotel.

On Monday morning 54 of her 75 guests had breakfast.

What percentage had breakfast?

Answer _____% [2]

[Turn over

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23 **(a)** Multiply out $5(2t + 7)$

Answer _____ [1]

(b) Factorise $16r - 8$

Answer _____ [1]

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24 Dean bought a new car.

He had to pay £220 plus 20% VAT per month for 3 years.

The mileage allowed before any charge was 30 000 miles for the 3 years.

Each additional mile was charged at 8p per mile.

After 3 years Dean had driven 37 200 miles.

How much did Dean pay in total for the 3-year period?

Answer £_____ [5]

[Turn over

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36GMC1131

25 (a) (i) Fiona wanted to do a survey about attendance at her school.

She designed a questionnaire for students to complete.

One of the questions was:

"How many days have you had off school?"

State **one** criticism of her question.

Answer _____

_____ [1]

(ii) She decides to give her questionnaires out to the first 20 students coming out of the Year 12 assembly one Monday.

State **two** reasons why her sample may not be representative of the whole school population.

Answer _____

_____

_____

_____ [2]

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(b) Fiona asked the school office for information about pupils who had arrived late to school on a certain day.

They told her that 14 pupils were late that day.

The list below shows how many minutes late each pupil was.

8	12	15	27	19	26	24
38	29	14	11	16	23	16

Show this information in an ordered stem and leaf diagram.

[3]

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36GMC1134

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For Examiner's use only	
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