GCSE

3310U40 – 1

MONDAY, 3 JUNE 2024 – MORNING

MATHEMATICS – NUMERACY

UNIT 2: CALCULATOR – ALLOWED

INTERMEDIATE TIER

1 hour 45 minutes plus your additional time allowance

A CALCULATOR WILL BE REQUIRED FOR THIS PAPER

Surname: _____

First name(s): _____

Centre Number: _____

Candidate Number: 0 _____

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	4	
2.	11	
3.	7	
4.	7	
5.	11	
6.	7	
7.	8	
8.	12	
9.	13	
Total	80	

ADDITIONAL MATERIALS

A ruler, a protractor and a pair of compasses may be required.

ITEMS INCLUDED WITH QUESTION PAPER

A separate Formula List.

A separate Diagram Booklet.

Model for Question 8 (c).

The Diagram Booklet MUST be handed in to the invigilators and sent for marking.

INSTRUCTIONS TO CANDIDATES

Use black ink, black ball – point pen, black felt tip or your usual method.

Write your name, centre number and candidate number in the spaces on the front cover.

Answer ALL questions.

Write your answers in the spaces provided.

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

Take π as $3 \cdot 14$ or use the π button on your calculator.

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.

1. **Shiona is saving to pay for a holiday.**
   She has 13 weeks to save £510 to pay for her holiday.

   Shiona already has savings of £95
   In the first week, she knows she can save £70

   She plans to save equal amounts of money in each of the remaining weeks.

   How much does Shiona need to save in each of the remaining weeks so that she can pay for her holiday?
   You must show all your working.

[4 marks]

2. Idris flies from Cardiff to Faro, in Portugal.

(a) The actual flying time is 133 minutes.
The plane flies at an average speed of 8 miles per minute.

(i) Calculate the flying distance between Cardiff and Faro.
Give your answer in miles.

[2 marks]

continued on the next page . . .

Question 2 continued

2. (a) (ii) Calculate the plane's average speed in MILES PER HOUR.

[2 marks]

continued on the next page . . .

Question 2 continued

2. (b) Idris takes a cabin bag on board his flight.

His bag measures

55 cm by 40 cm by 23 cm.

The label on his cabin bag says,

Bag capacity is greater than 48 litres.

Is this label correct?

Yes ☐ **No** ☐

You must show all your working and give a reason for your answer.

[3 marks]

2. (c) Idris looks out of the aeroplane window.
He notices a village below.
Idris takes a photograph of the village to try to work out where he is.
From the photograph, he draws a sketch including some parallel streets.

Look at the diagram for Question 2 (c) in the separate Diagram Booklet.
The diagram is NOT drawn to scale.
The diagram shows his sketch.

continued on the next page . . .

Question 2 (c) continued

Find the size of each of the angles *w*, *x*, *y* and *z*.

w = _____ °

x = _____ °

y = _____ °

z = _____ °

[4 marks]

3. IN THIS QUESTION, YOU WILL BE ASSESSED ON THE QUALITY OF YOUR ORGANISATION, COMMUNICATION AND ACCURACY IN WRITING.

Look at the information provided for Question 3 in the separate Diagram Booklet.
Gracie decides to buy a new ZX31 camera.
On the internet, she sees advertisements for the camera she wants.

Gracie knows that the exchange rate is
£1 = $1.25

She wants to buy the ZX31 camera that is the best value for money.

Which of the advertisements offers the best option for Gracie?
You must show all your working.

[5 marks + 2 marks OCW]

4. During the 30 days in the month of September, Andras used 138 m^3 of gas.
The cost of this gas was 12p per kWh.
Look at the formula for Question 4 in the separate Diagram Booklet.

The standing charge was 32p per day.
VAT at 5% was payable on the sum of the cost of the gas used and the standing charge.

Calculate Andras's gas bill for September.
You must show all your working.

[7 marks]

5. The Severn Bridge was built in 1966 to allow vehicles to travel between England and Wales.

Look at the diagram for Question 5 in the separate Diagram Booklet.
The diagram represents the Severn Bridge.

The bridge has a width of 23 m and a total length of 1600 m.
The section of the bridge between the two towers is 988 m long.

The tarmac road surface is 0•035 m thick.

The cables from the towers to support the road are made from 18 000 miles of wire.

continued on the next page . . .

Question 5 continued

5. (a) What fraction of the total length of the bridge is the section between the two towers? Give your fraction in its simplest form.

[2 marks]

continued on the next page . . .

Question 5 continued

5. (b) Calculate the length of the wire used to make the cables in KILOMETRES.

[2 marks]

continued on the next page . . .

Question 5 continued

5. (c) The cost of tarmac is £250 per m^3

Calculate the cost of the volume of tarmac needed to resurface the total length of the Severn Bridge.

[3 marks]

continued on the next page . . .

Question 5 continued

5. (d) Some of the tolls charged for a car to enter Wales are given in the table below.

YEAR	TOLL FOR A CAR
2004	£4.60
2009	£5.40
2014	£6.40
2019	FREE

In which of the following 5 – year periods was there the greatest percentage increase in the toll?

2004 to 2009 2009 to 2014 2014 to 2019

continued on the next page . . .

Question 5 (d) continued

State the percentage increase for this

5 – year period.

You must show all your working.

continued on the next page . . .

Question 5 (d) continued

The greatest percentage increase in the toll was in the period _____ to_____.

The percentage increase was _____.

[4 marks]

continued on the next page . . .

6. (a) Look at the diagram for Question 6 (a) in the separate Diagram Booklet.
The diagram is a frequency polygon.

A survey was carried out to find the total time people took to read the book 'Wales is a Celtic Country'.
The results are shown in the frequency polygon.

(i) Which is the modal group?
Circle your answer.

18 to 24 hours	21 hours	12 to 18 hours	34 hours	30 to 36 hours

[1 mark]

continued on the next page . . .

Question 6 (a) continued

6. (a) (ii) How many people took part in the survey?
Circle your answer.

35	**30**	**65**	**100**	**108**

[1 mark]

continued on the next page . . .

Question 6 (a) continued

6. (a) (iii) How many of the people in the survey took 24 hours or more to read this book?

Circle your answer.

15	35	50	25	85

[1 mark]

continued on the next page . . .

Question 6 (a) continued

6. (a) (iv) Did any of the people in the survey take less than 6 hours to read this book?

Yes ☐ **No** ☐ **Can't tell** ☐

You must give a reason for your answer.

_____

_____

_____

_____

_____

_____

[1 mark]

continued on the next page . . .

Question 6 continued

6. (b) Four books are placed in a stack.

The thickness of each of the books is as follows:

22 mm 25 mm 29 mm 31 mm

The thickness of each book is measured CORRECT TO THE NEAREST mm. Show that the total height of the stack of these four books cannot be more than 109 mm.

[3 marks]

7. (a)

Remember:
1 kilowatt (kW) = 1000 watts (W)

There are 8 street lights in Ffordd Alwyn. Each light is fitted with an 80 watt light bulb.

Each of the 8 street lights is usually on from 6 p.m. to 6 a.m.

It costs 32.4p per hour for each KILOWATT of electricity used.

How much would be saved PER WEEK if the 8 street lights were only on from 7 p.m. to 5 a.m.?

Give your answer in pounds, correct to the nearest penny.
You must show all your working.

[5 marks]

continued on the next page . . .

Question 7 continued

7. (b) Look at the diagram for Question 7 (b) in the separate Diagram Booklet.
The diagram IS NOT drawn to scale.

A lamp post is vertical and stands on horizontal ground, as shown in the diagram. The angle of elevation of the top of the lamp post is 68° when measured from a point $3 \cdot 3$ m from the base of the lamp post.

Calculate the height of the lamp post.

[3 marks]

8. (a) **50** people living by the sea were asked how often they went for a walk along the sea wall each week.

The results were as follows:

Number of walks each week	Frequency
0 to 2	8
3 to 5	12
6 to 8	20
9 to 13	4
14 to 18	6

continued on the next page…

Question 8 (a) continued

Calculate an estimate of the mean number of walks per person each week.

[4 marks]

continued on the next page . . .

Question 8 continued

8. (b) High tide in the morning is, on average, 35 minutes later each day.
The morning high tide on 3rd March was at 08:03

At what time was the morning high tide on 1st March?

[1 mark]

continued on the next page . . .

Question 8 continued

8. (c) Ask for the model for Question 8 (c).
The model is NOT made to scale.

A new concrete sea – defence wall is to be built.
The sea – defence wall will have a uniform cross – section.
The model represents the new wall.

Look at the diagram for Question 8 (c) in the separate Diagram Booklet.
The diagram is NOT drawn to scale.
The diagram shows the uniform cross – section labelled *ABCD.*
In the diagram:

$AB = 12 \cdot 6$ m

$AD = 7 \cdot 6$ m

$DC = 18 \cdot 8$ m

The wall is 50 m long.

continued on the next page . . .

Question 8 (c) continued

Calculate the volume of concrete needed to make this new sea – defence wall.
You must show all your working.

[7 marks]

9. (a) A volcano is an opening in the Earth's crust, through which molten lava, hot ash and gases escape into the air.

(i) An estimated 500 000 000 people live near active volcanoes.
What is 500 000 000 written in standard form?

_____

_____

_____

[1 mark]

continued on the next page . . .

Question 9 (a) continued

9. (a) (ii) The teragram is a unit of mass.

1 teragram = 10^9 kg

Last year, a volcano released a total of 140 teragrams of carbon dioxide in 300 days.

Calculate the average number of kilograms of carbon dioxide that were released by this volcano PER HOUR.
Give your answer correct to 3 significant figures.
You must show all your working.

[5 marks]

continued on the next page . . .

Question 9 continued

9. (b) (i) Look at the diagram for Question 9 (b) (i) in the separate Diagram Booklet.
The diagram is NOT drawn to scale.

The planet Venus orbits the Sun.
Its orbit can be considered to be circular.
This is represented in the diagram.

The distance between Venus and the Sun is $1 \cdot 08 \times 10^8$ km.

Venus orbits the Sun once every $224 \cdot 7$ days.

Calculate the distance Venus travels in 1 day.
Give your answer in standard form.

[4 marks]

continued on the next page . . .

Question 9 (b) continued

9. (b) (ii) The surface area of Venus is

$460\ 234\ 320\ km^2$

The surface of Venus is

wrinkled – volcanic,

smooth – volcanic or

NON – volcanic.

The areas of these three different types of surface are in the ratio 7 : 1 : 2

Look at the information provided for Question 9 (b) (ii) in the separate Diagram Booklet.

Calculate the total surface area of Venus that IS volcanic.

You must show all your working.

[3 marks]

END OF PAPER

TOTAL 80 MARKS

Question Number	Additional pages, if required. Write the question number(s) in the left – hand margin.

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GCSE

3310U40-1

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MATHEMATICS – NUMERACY

UNIT 2: CALCULATOR – ALLOWED

INTERMEDIATE TIER

The Diagram Booklet MUST be handed in to the invigilators and sent for marking.

Diagram Booklet

Surname: _____

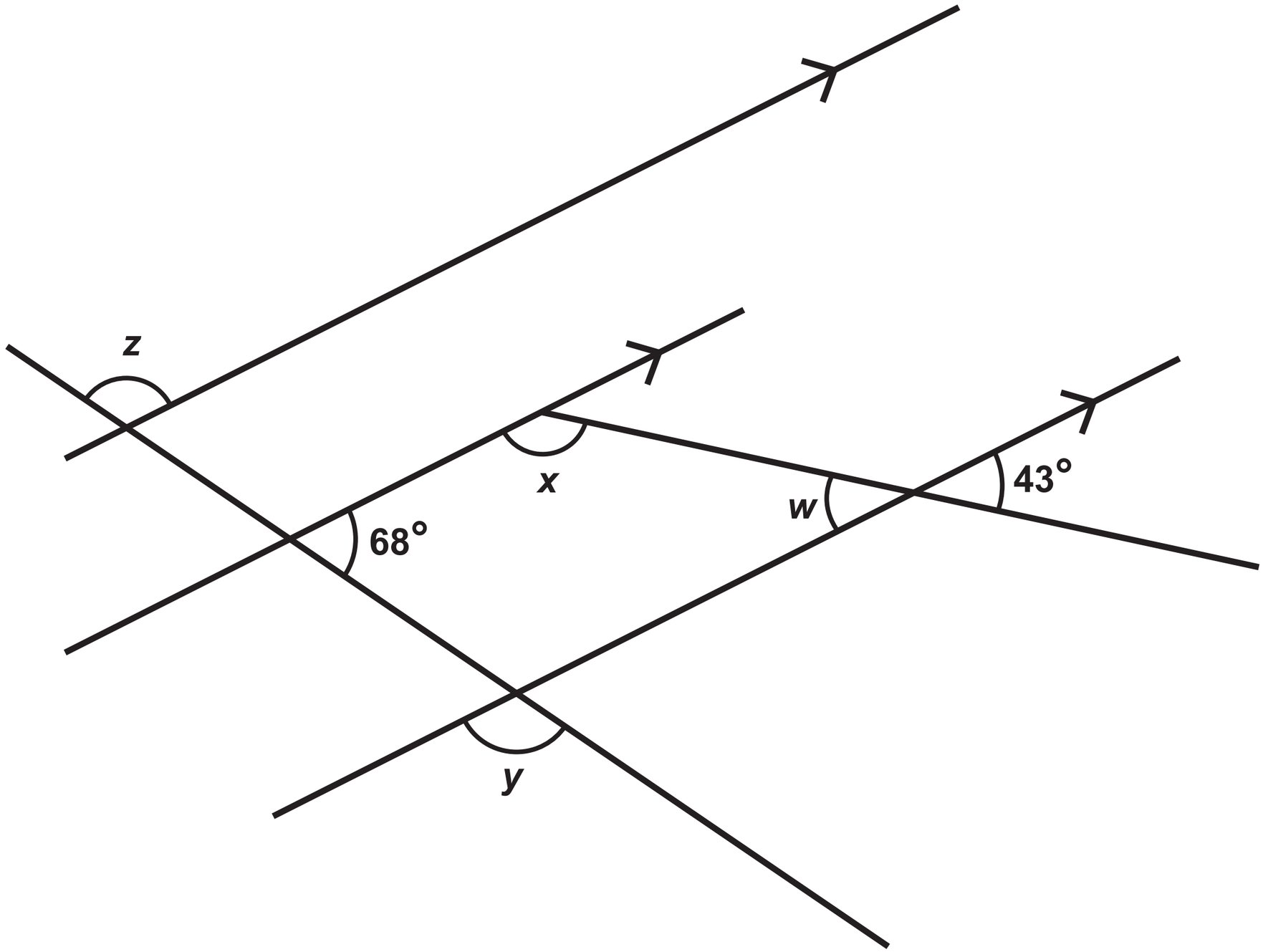
First name(s): _____

Centre Number: _____

Candidate Number: 0 _____

Question 2 (c)

Diagram NOT drawn to scale



Question 3

Information

CAMERA FOX	US CAMERA GEEK	SURE CAMERA
ZX31 camera **£62.95** + **£3.90** delivery	ZX31 camera **$81.20** with FREE international delivery	ZX31 camera special offer. Usual price **£75** NOW **14%** discount AND free delivery

Question 4

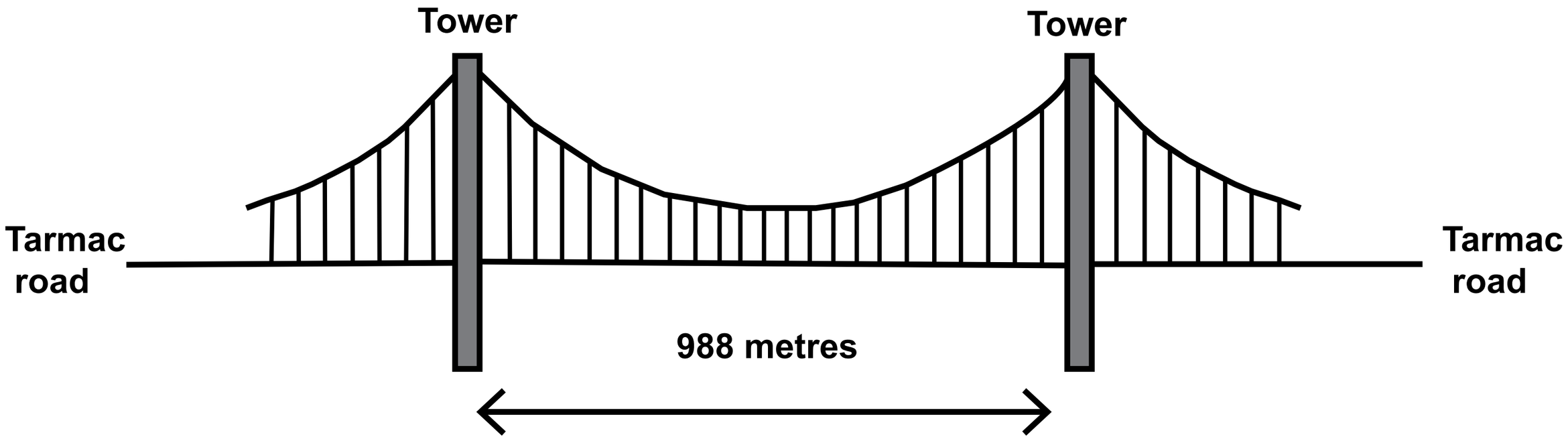
Formula

The formula used to calculate the number of kWh for the gas used is as follows:

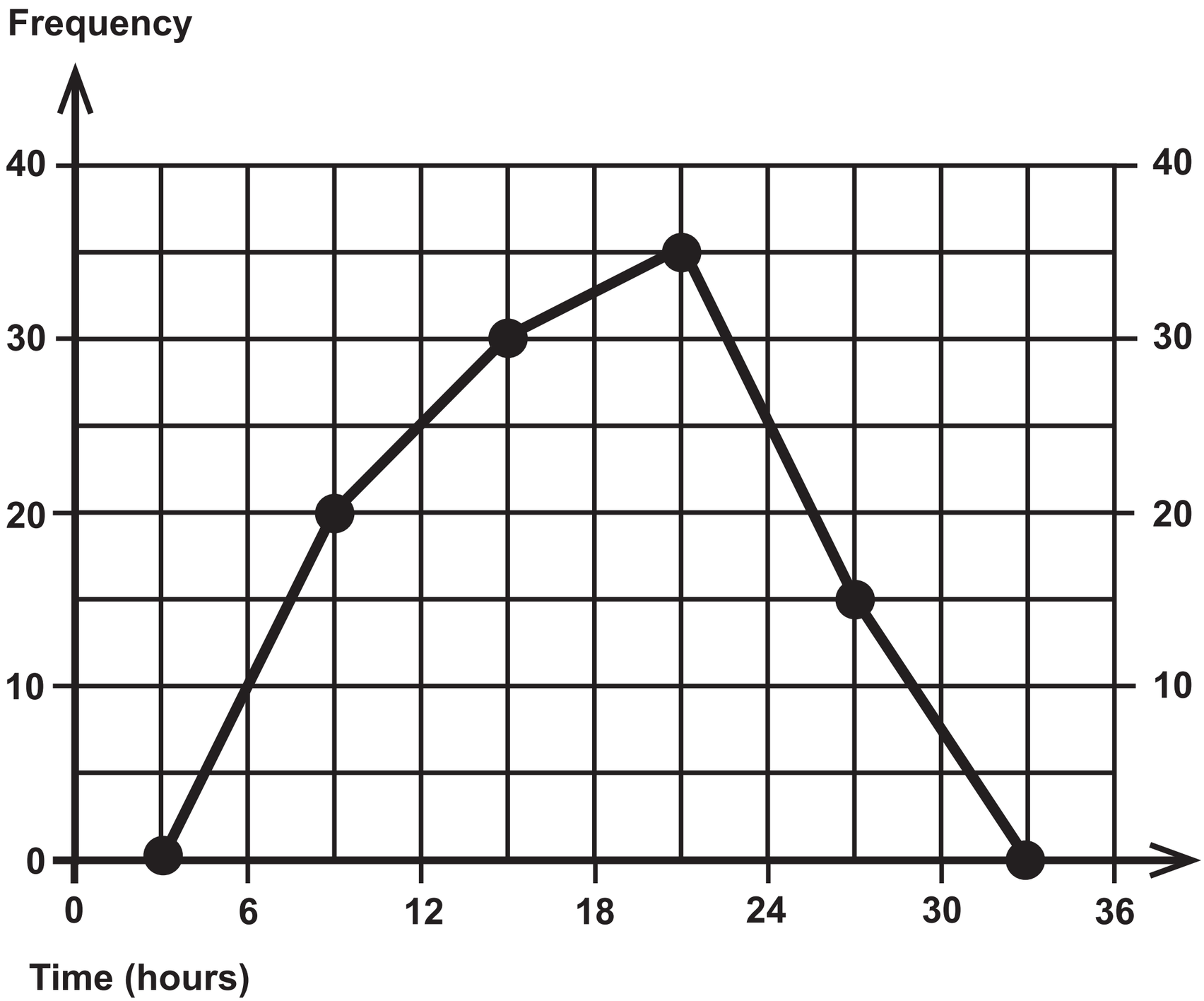
$$\text{Number of kWh} = \text{number of } m^3 \text{ of gas} \times 39{\cdot}5 \times 1{\cdot}02264 \div 3{\cdot}6$$

Question 5

Diagram NOT drawn to scale

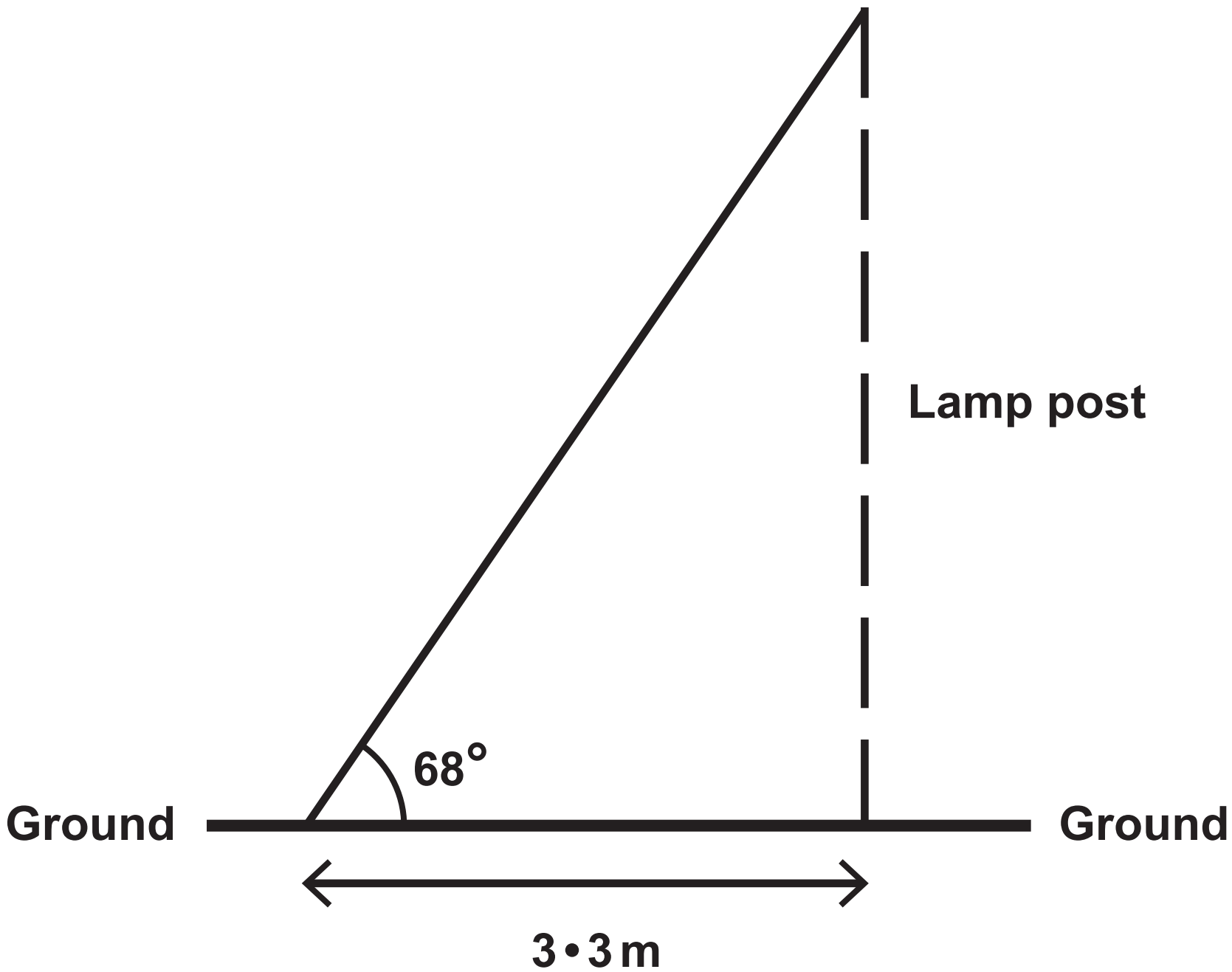


Question 6 (a)



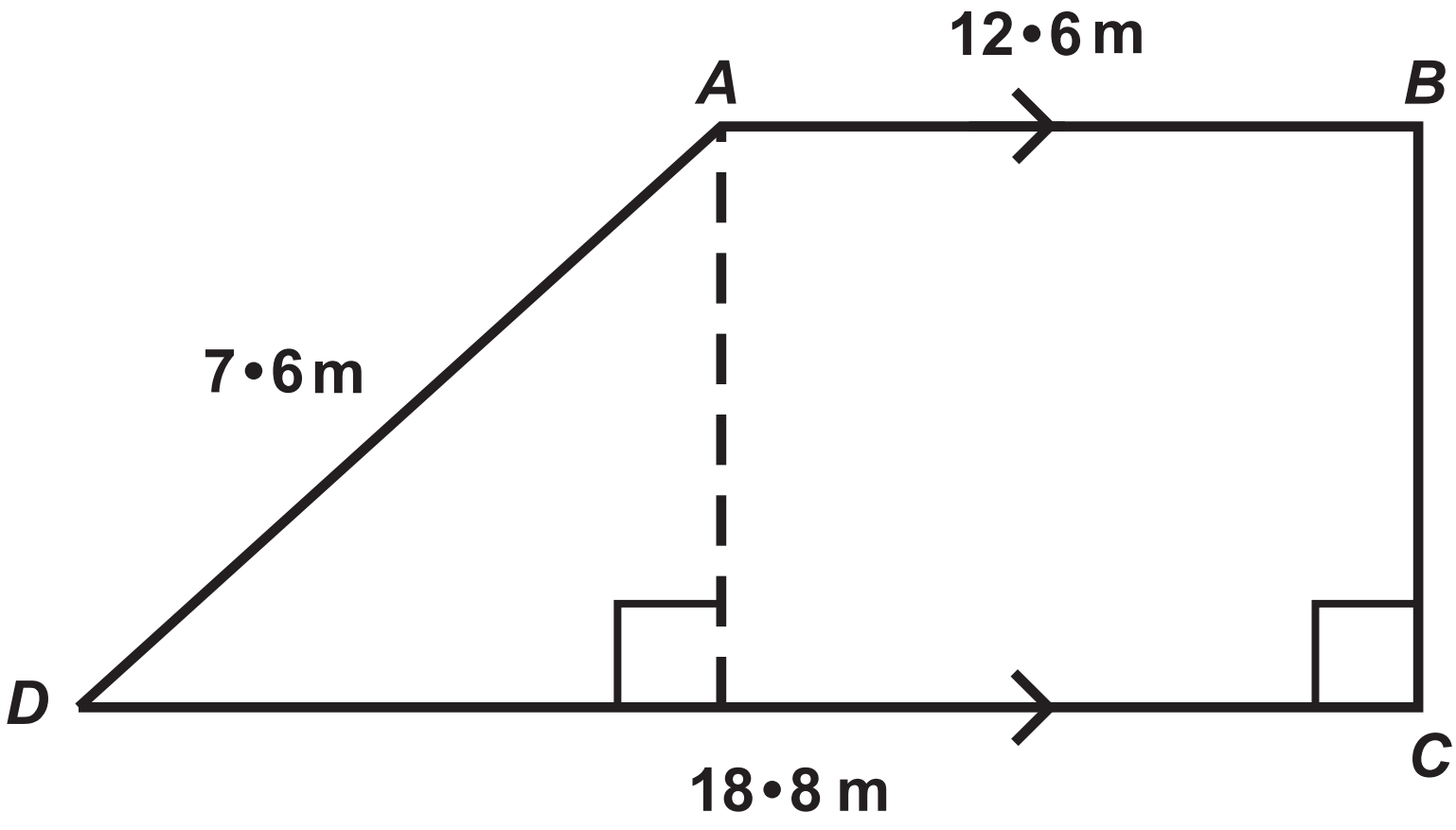
Question 7 (b)

Diagram NOT drawn to scale



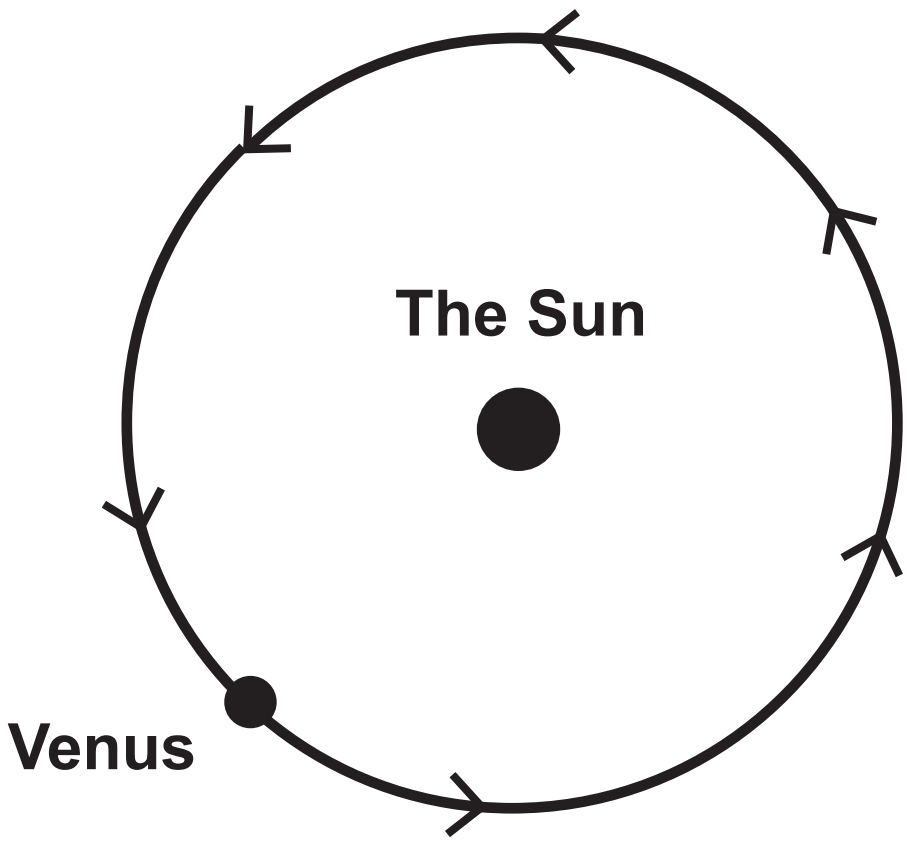
Question 8 (c)

Diagram NOT drawn to scale



Question 9 (b) (i)

Diagram NOT drawn to scale



Question 9 (b) (ii)

Information

Wrinkled – volcanic : Smooth – volcanic : Non – volcanic = 7 : 1 : 2

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and
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FORMULA LIST
INTERMEDIATE TIER
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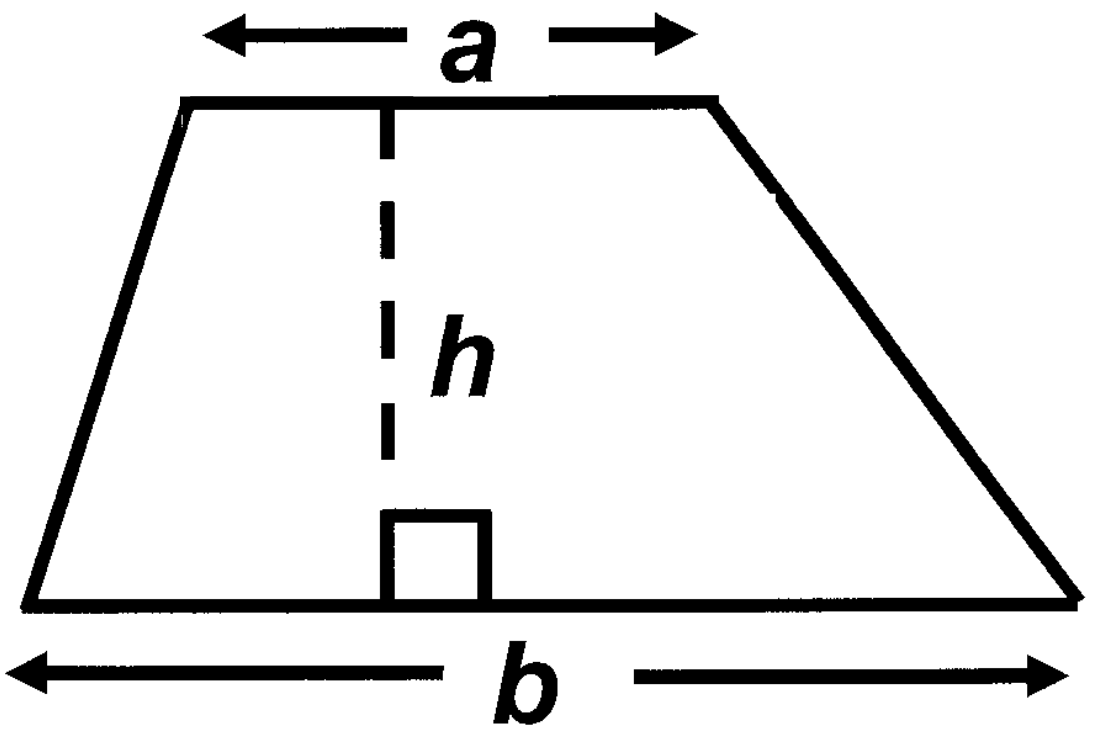
You must not write on these formula pages.

Anything you write on these formula pages will gain NO credit.

Formula List – Intermediate Tier

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



Volume of prism =

area of cross – section × length