



GCSE

3310U60 –1

WEDNESDAY, 4 JUNE 2025 – MORNING

MATHEMATICS – NUMERACY

UNIT 2: CALCULATOR – ALLOWED

HIGHER 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.	3	
2.	5	
3.	3	
4.	9	
5.	10	
6.	3	
7.	9	
8.	11	
9.	16	
10.	5	
11.	6	
Total	80	

ADDITIONAL MATERIALS

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

ITEMS INCLUDED WITH QUESTION PAPER

A separate Formula List.

A separate Diagram Booklet.

Models for Question 1 and Question 11

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

(Turn over)

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 in the spaces provided.

If you run out of space, use the additional page(s) at the back of the booklet, taking care to number the question(s) correctly.

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

(Turn over)

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 2, the assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing.

(Turn over)

- 1. Ask for the models for Question 1.
The models are NOT made to scale.
The models represent two vases.**

Nina sells flowers.

She wants to display her flowers.

**She buys two glass vases from
a website.**

The two vases are different shapes.

Vase 1 is a cuboid.

Vase 2 is a cylinder.

**Each vase can hold 1648 cm^3 of water
when it is full.**

continued on the next page . . .

(Turn over)

Question 1 continued

The vase in the shape of a cuboid has a height of $20 \cdot 6$ cm.

The radius of the base of the cylindrical vase is 6 cm.

The website states that both of these vases have the same height.

Is the website correct?

You must show all your working.

The website is correct

☐

The website is incorrect

☐

(Turn over)

7

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

[3 marks]

(Turn over)

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

Elfed goes to the park to exercise.

Yesterday he ran 10 km and then walked a further 4 km.

Elfed ran for 45 minutes and walked for 1 hour.

What was Elfed's overall average speed for his exercise in the park yesterday?

continued on the next page . . .

(Turn over)

Question 2 continued

Give your answer in km/h.

You must show all your working.

(Turn over)

10

[3 marks + 2 marks OCW]

(Turn over)

- 3. Bethan bought a house in January 2000 for £30 000**

In the first 10 years, her house increased in value each year by 6% of its previous year's value.

In the following 15 years, her house increased in value each year by 11% of its previous year's value.

Calculate the value of Bethan's house in January 2025.

12

[3 marks]

(Turn over)

- 4. 100 people took part in a fundraising event last Saturday and Sunday. They raised money for charity by working towards some fitness targets.**

(a) The target for Saturday was to achieve a mean of 6500 steps per person.

Look at the table for Question 4 (a) in the separate Diagram Booklet. The results for Saturday are shown in the table.

continued on the next page . . .

(Turn over)

Question 4 (a) continued

- 4. (a) (i) Calculate an estimate of the mean number of steps per person on Saturday to show that this target was met.**

(Turn over)

[4 marks]

continued on the next page . . .

(Turn over)

Question 4 (a) continued

4. (a) (ii) Osian says,

“None of these 100 people recorded more than 10 000 steps on Saturday.”

Is this statement certainly true, not true, or is it not possible to tell?

You must give a reason for your answer.

Certainly true

☐

Not true

☐

Not possible to tell

☐

(Turn over)

[1 mark]

continued on the next page . . .

(Turn over)

Question 4 continued

- 4. (b) On Sunday, the 100 people were divided into three groups, A, B and C, based upon their results from the Saturday.**

Each group was given a target of a mean number of steps per person.

The targets for groups A, B and C, were 8000, 9000 and 10 000 steps, respectively.

continued on the next page . . .

(Turn over)

Question 4 (b) continued

**Look at the table for
Question 4 (b) in the separate
Diagram Booklet.**

**The table shows the mean number
of steps per person that each group
achieved on Sunday.**

**The ratio of the number of people in
the different groups was**

$$\mathbf{A : B : C = 18 : 4 : 3}$$

continued on the next page . . .

(Turn over)

Question 4 (b) continued

- 4. (b) (i) Calculate the overall mean of the number of steps taken per person by these 100 people on Sunday.**

(Turn over)

[3 marks]

continued on the next page . . .

(Turn over)

Question 4 (b) continued

4. (b) (ii) The organiser says,

**“A fabulous result on Sunday!
Two of the three groups met
their target.**

**This means that two – thirds of
the targets given were met.”**

**Give a reason why this could be
seen as a misrepresentation of the
outcome of Sunday’s fundraising
event.**

(Turn over)

23

[1 mark]

(Turn over)

5. Look at the table for Question 5 in the separate Diagram Booklet. Gwilym is giving a talk about the amount of food that was wasted in 2019.

He has found some details of food waste in 2019.

The table shows these details.

continued on the next page . . .

Question 5 continued

- 5. (a) (i) The population data seems to be given correct to a certain number of significant figures. To how many significant figures does the data seem to be given?
Circle your answer.**

Three	One	Ten	Eight	Two
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[1 mark]

continued on the next page . . .

(Turn over)

Question 5 (a) continued

- 5. (a) (ii) Use the data from the table for Question 5 in the separate Diagram Booklet to complete the following statements. You must show all your working.**

‘On average, a person in France produced _____ kilograms of food waste.

This was _____ times the average amount of food waste per person in China.’

(Turn over)

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[4 marks]

continued on the next page . . .

(Turn over)

Question 5 continued

- 5. (b) The area of the United Kingdom is 242 500 km²**

Use this information and the information in the table for Question 5 in the separate Diagram Booklet, to answer the following questions about 2019.

- (i) What was the population density of the UK?**

(Turn over)

_____ people per km²
[2 marks]

continued on the next page . . .

Question 5 (b) continued

- 5. (b) (ii) What was the average food waste per km² in the UK?
Give your answer in TONNES.**

31

_____ tonnes

[3 marks]

(Turn over)

6. A builder wants to put a ladder safely against a wall.

The builder should follow the ‘4 up, 1 out’ rule.

This means that, for every 4 units of height up the wall that the top of the ladder reaches, the base of the ladder should be 1 unit away from the wall.

Look at the diagram for Question 6 in the separate Diagram Booklet.

The diagram is NOT drawn to scale.

The diagram shows a ladder placed safely against a vertical wall.

continued on the next page . . .

(Turn over)

Question 6 continued

**Calculate the angle between the
horizontal ground and the ladder.**

(Turn over)

[3 marks]

(Turn over)

- 7. Dyfan has two different 25 g bars of chocolate, a Chocodusk bar and a Luxury Dark bar.**

The Chocodusk bar has a lower cocoa content than the Luxury Dark bar.

- (a) Look at the tables for Question 7 (a) in the separate Diagram Booklet. There are two tables. Table 1 gives the nutritional information about the CHOCODUSK bar.**
- Table 2 gives the nutritional information about the LUXURY DARK bar.**

continued on the next page . . .

(Turn over)

Question 7 (a) continued

7. (a) (i) Complete the following statement.

‘The amount of salt in the Luxury Dark bar is _____ % of the amount of salt in the Chocodusk bar.’

[1 mark]

continued on the next page . . .

(Turn over)

Question 7 (a) continued

- 7. (a) (ii) Dyfan eats 20 g of the Luxury Dark bar.**

Calculate the percentage of the Chocodusk bar that gives Dyfan the same amount of saturated fat.

You must show all your working.

(Turn over)

continued on the next page . . .

(Turn over)

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. The diagram shows the symmetrical uniform cross – section of one of the chocolate bars.**

In the diagram:

$$**AB = 68 \text{ mm}**$$

$$**AD = 7 \text{ mm}**$$

$$**DC = 60 \text{ mm}**$$

continued on the next page . . .

(Turn over)

Question 7 (b) continued

The label on this chocolate bar states,

‘The thickness of this chocolate bar is 6 mm, correct to the nearest millimetre.’

Use the measurements given on the diagram to decide whether this statement is true or false.

True ☐ **False** ☐

You must show all your working.

(Turn over)

[illegible]

(Turn over)

42

[5 marks]

(Turn over)

- 8. (a) A hot air balloon is initially descending at a speed of 3 m/s. A passenger drops their phone out of the balloon. The phone accelerates due to gravity at a rate of 9.8 m/s^2 and hits the ground with a speed of 50 m/s.**

Look at the formula for Question 8 (a) in the separate Diagram Booklet.

The speed, $v \text{ m/s}$, of the phone when it hits the ground is given by the formula shown.

continued on the next page . . .

(Turn over)

Question 8 (a) continued

Use the formula to calculate the height from which the phone was dropped.

(Turn over)

[4 marks]

continued on the next page . . .

(Turn over)

Question 8 continued

8. (b) Consider the Earth to be a sphere.

The mass of the Earth

is 6.0×10^{24} kg,

**CORRECT TO 2 SIGNIFICANT
FIGURES.**

The volume of the Earth

**is 1.09×10^{21} m³ CORRECT TO
3 SIGNIFICANT FIGURES.**

**Calculate the greatest possible
density of the Earth.**

Give your answer in kg/m³

(Turn over)

[3 marks]

continued on the next page . . .

(Turn over)

Question 8 continued

- 8. (c) Look at the diagram for Question 8 (c) in the separate Diagram Booklet. The diagram is NOT drawn to scale.**

Here are some approximations about the Earth's motion around the Sun.

- The Earth follows a circular path around the Sun.**
- The Earth makes 1 complete revolution of the Sun in 365 days.**
- The speed of the Earth is 29 700 m/s.**

continued on the next page . . .

(Turn over)

Question 8 (c) continued

Use these approximations to calculate the radius, in metres, of the Earth's motion around the Sun.

Give your answer in standard form.

(Turn over)

50

[4 marks]

(Turn over)

9. NoomAir is a cargo plane company based in Nice.

Two of their planes have been hired to deliver cargo to the cities of Rome, Valencia and Tunis.

(a) (i) Look at the diagram for Question 9 (a) (i) in the separate Diagram Booklet. The diagram is NOT drawn to scale. The diagram shows a map of the mediterranean sea and surrounding cities: Valencia, Nice, Rome and Tunis.

continued on the next page . . .

(Turn over)

Question 9 (a) (i) continued

One of the planes will fly from Nice to Rome, and then on to Tunis.

The pilot knows the following information.

- **From Nice, Rome is 470 km on a bearing of 115°**
- **From Nice, Tunis is 805 km on a bearing of 162°**

Calculate the distance from Rome to Tunis.

(Turn over)

[4 marks]

continued on the next page . . .

(Turn over)

Question 9 (a) continued

9. (a) (ii) The second plane will fly from Nice to Valencia, and then on to Tunis.

The pilot of this plane knows the following information.

- **Valencia is on a bearing of 234° from Nice.**
- **The distance between Valencia and Tunis is 970 km.**

Calculate the bearing of Tunis from Valencia.

(Turn over)

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(Turn over)

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

[6 marks]

continued on the next page . . .

(Turn over)

Question 9 continued

- 9. (b) Look at the diagrams for Question 9 (b) in the separate Diagram Booklet. The diagrams are NOT drawn to scale.**
- NoomAir sells toy replicas of one of its cargo planes.**
- There are two diagrams.**
- They represent replicas of one of the cargo planes. They are mathematically similar.**
- Diagram 1 represents a large toy plane.**
- Diagram 2 represents a small toy plane.**

continued on the next page . . .

(Turn over)

Question 9 (b) continued

**The volume of a large toy plane
is 6 times the volume of a small
toy plane.**

**The length of a large toy plane
is 30 cm.**

**Calculate the length of a small
toy plane.**

(Turn over)

60

[3 marks]

(Turn over)

Question 9 continued

9. (c) NoomAir makes 200 of the large toy planes.

It takes a random sample of 5 of these 200 toy planes to check the quality of their production.

Look at the numbers for Question 9 (c) in the separate Diagram Booklet. The numbers are taken from a table of random digits.

continued on the next page . . .

(Turn over)

Question 9 (c) continued

**Use these numbers to choose
5 toy planes from the 200
toy planes.**

**You must start with the first
number in the list.**

**Describe clearly how you use the
numbers to select the sample.**

(Turn over)

The numbers of the 5 toy planes in the sample are:

[3 marks]

(Turn over)

10. Menna is going to invest £400 in her bank's savings account.

The savings account has a special interest rate for one year only.

The account pays 0.2% interest per month for the first 10 months, and then 1.7% interest per month for the last 2 months of the year.

Calculate the AER the bank should be advertising on the account.

Give your answer as a percentage, correct to 2 decimal places.

(Turn over)

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(Turn over)

[5 marks]

(Turn over)

11. Ask for the model for Question 11.

The model is NOT made to scale.

The model represents a bike shelter.

**Pupils in Ysgol Ddwysaint have
designed a new bike shelter.**

It is made of 3 clear plastic sheets.

**The two ends of the shelter are equal
in size.**

**The back and roof of the shelter are
made from one CURVED rectangular
sheet that connects the two
end sheets.**

The bike shelter is 6 metres long.

continued on the next page . . .

(Turn over)

Question 11 continued

Look at the diagram for Question 11 in the separate Diagram Booklet.

The diagram is NOT drawn to scale.

One of the end sheets is shown.

AC is an arc of a circle with centre O and radius 2.5 metres.

$BC = 1.4$ metres and

angle $AOC = 75^\circ$

Calculate the total area of plastic used to make the bike shelter.

(Turn over)

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(Turn over)

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

(Turn over)

[6 marks]

END OF PAPER
TOTAL 80 MARKS

[illegible]

(Turn over)

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

(Turn over)

[illegible]



GCSE

3310U60 – 1

WEDNESDAY, 4 JUNE 2025 – MORNING

MATHEMATICS – NUMERACY

UNIT 2: CALCULATOR – ALLOWED

HIGHER TIER

Diagram Booklet

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

Surname: _____

First name(s): _____

Centre Number: _____

Candidate Number: 0 _____

Question 4 (a)

Table

Number of steps	Number of people
3001 to 5000	22
5001 to 7000	30
7001 to 9000	42
9001 to 11 000	6

Question 4 (b)

Table

Group	A	B	C
Mean number of steps per person achieved	5802	9830	12 200

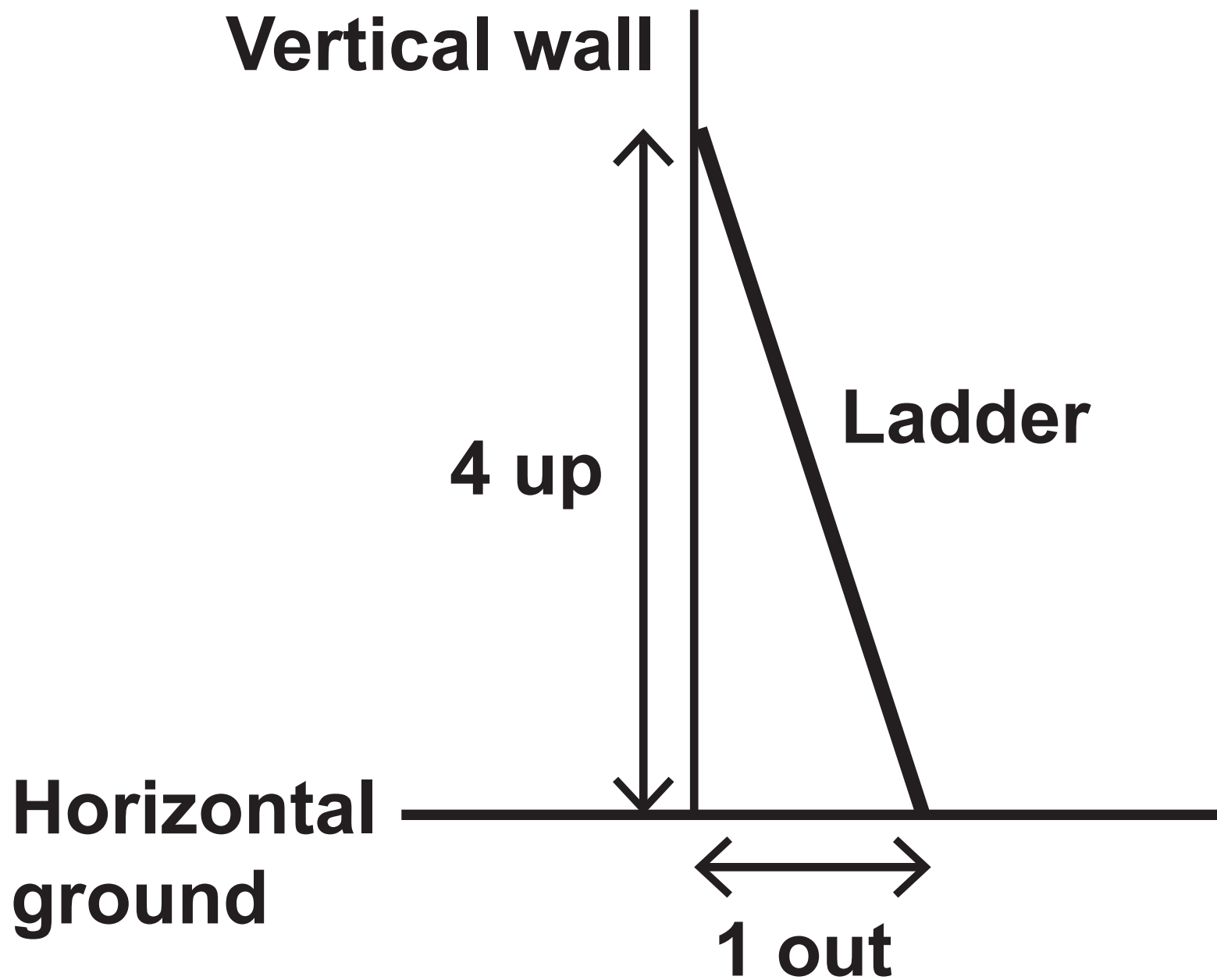
Question 5

Table

Country	Total food waste in KILOGRAMS	Population
China	91 646 213 000	1 440 000 000
France	5 522 358 000	65 400 000
United Kingdom	5 199 825 000	67 600 000

Question 6

Diagram NOT drawn to scale



Question 7 (a)

Table 1

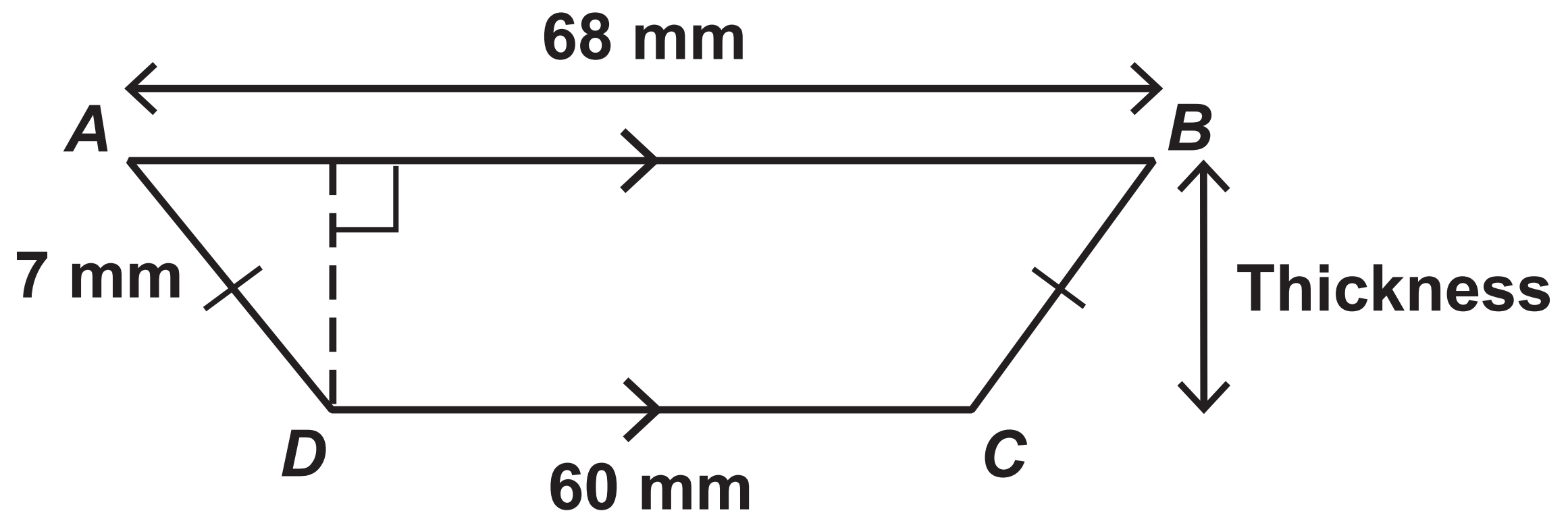
CHOCODUSK bar: lower cocoa content	
	Per 25 g bar
Saturated fat	6•6 g
Sugar	7•1 g
Protein	3•5 g
Salt	0•01 g

Table 2

LUXURY DARK bar: higher cocoa content	
	Per 25 g bar
Saturated fat	7•7 g
Sugar	3•5 g
Protein	2•9 g
Salt	0•09 g

Question 7 (b)

Diagram NOT drawn to scale



Question 8 (a)

$$v = \sqrt{u^2 + 2gh}$$

where:

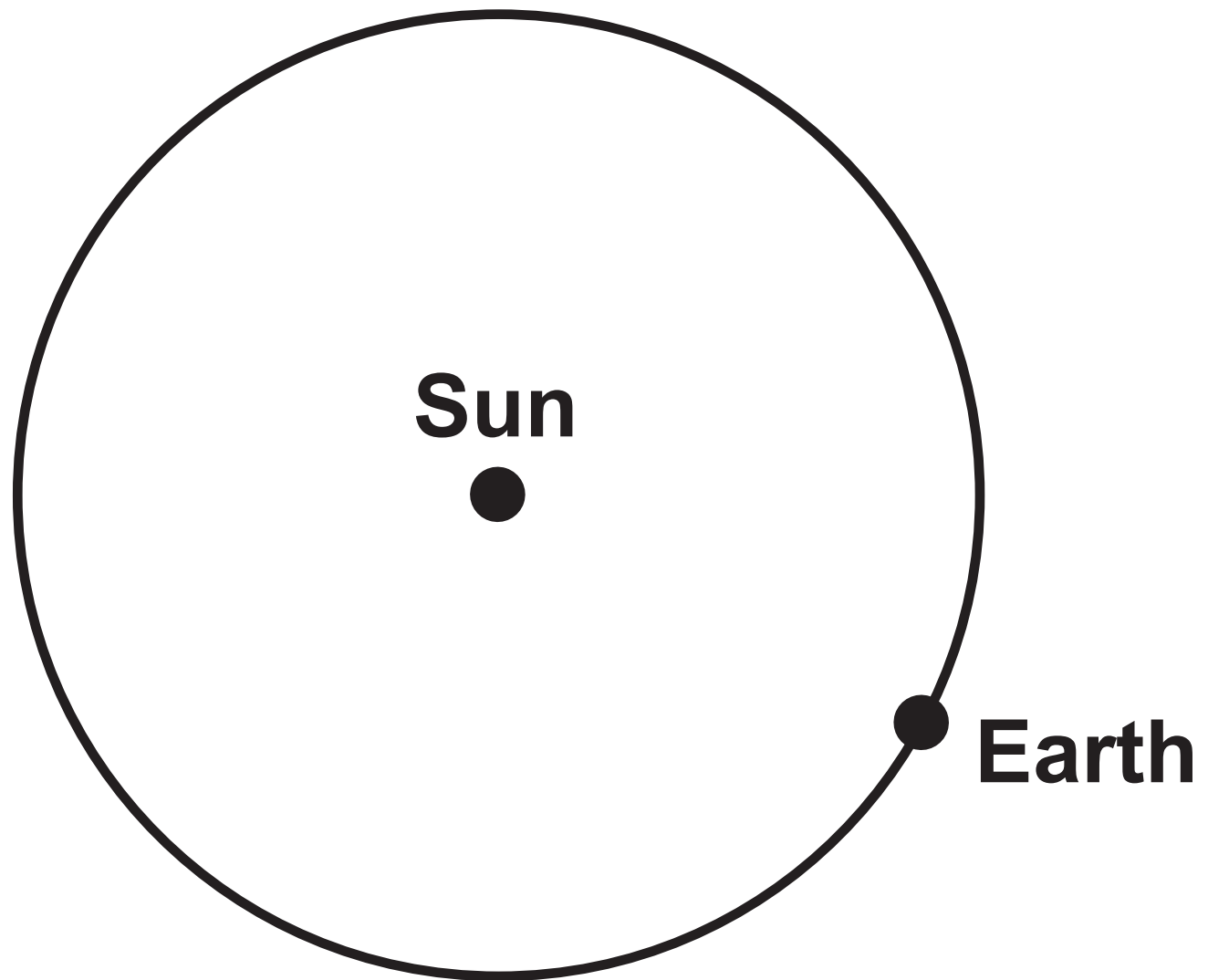
u is the initial speed of the phone,

g is the acceleration due to gravity,

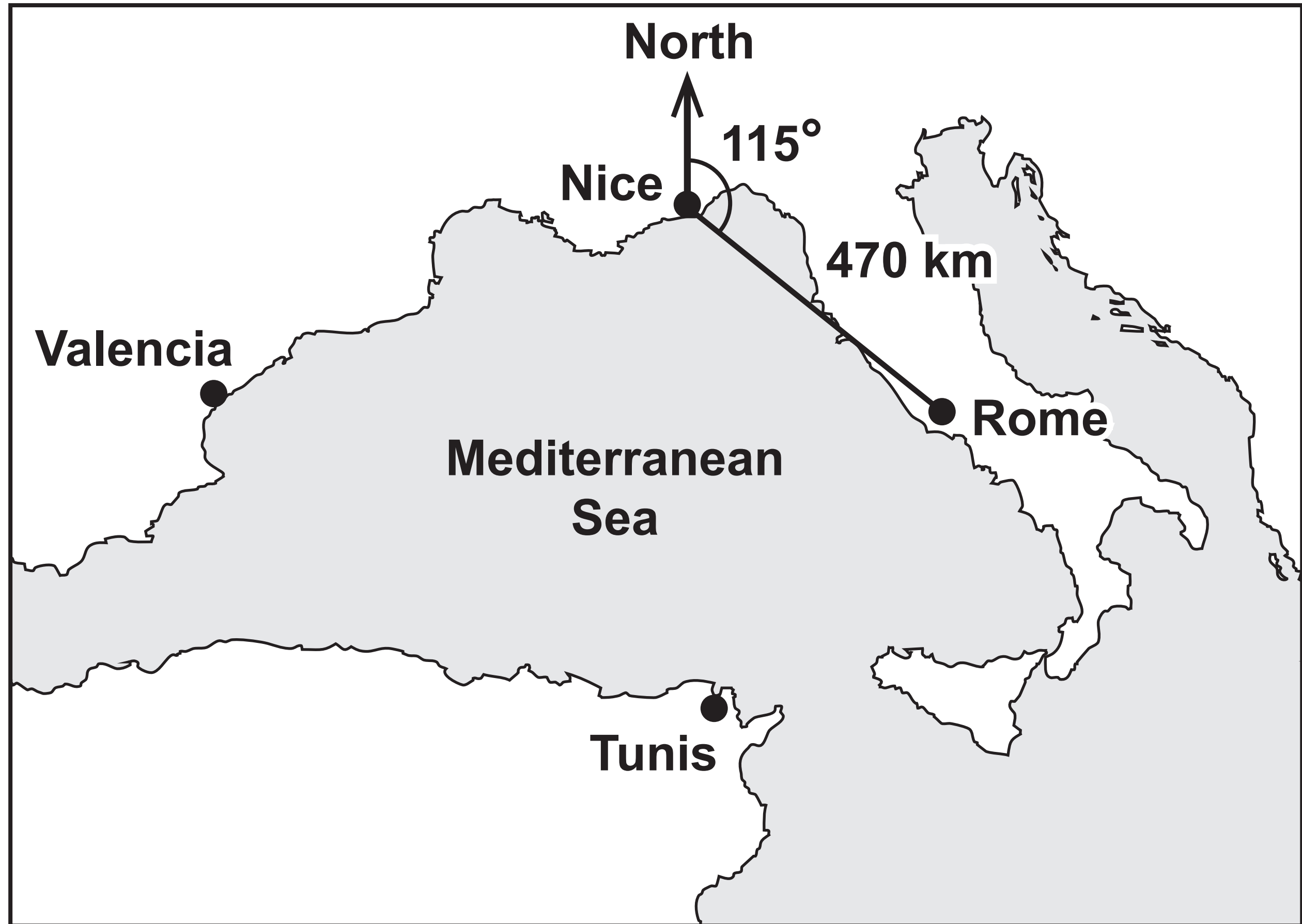
**h is the height above the ground from
which the phone was dropped.**

Question 8 (c)

Diagram NOT drawn to scale



Question 9 (a) (i)



Question 9 (b)

Diagrams NOT drawn to scale

Diagram 1

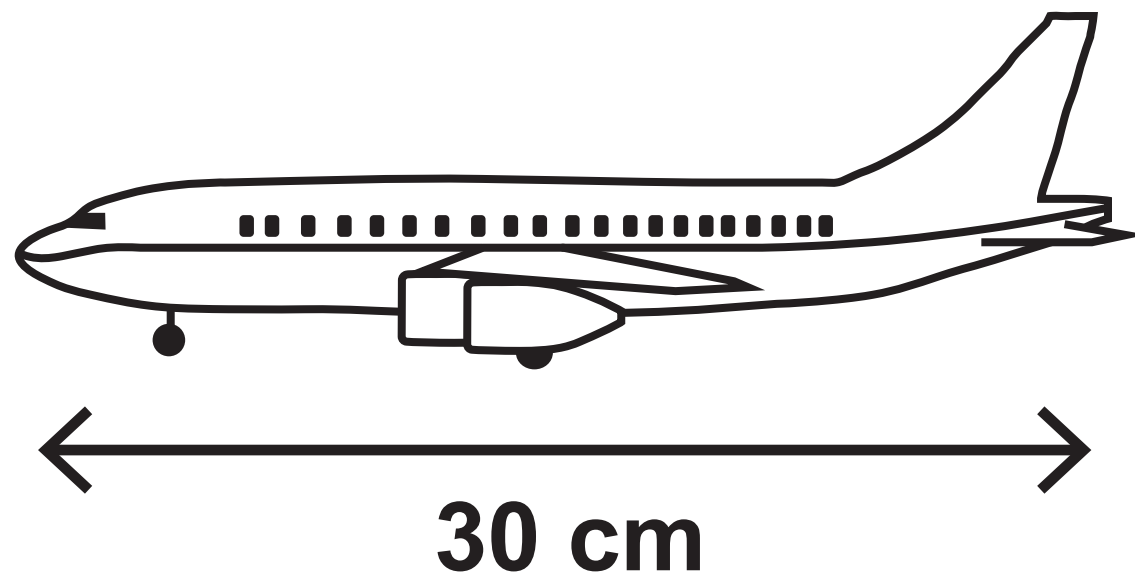
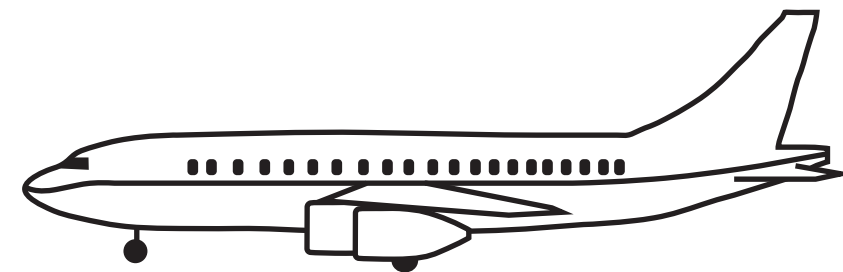


Diagram 2



Question 9 (c)

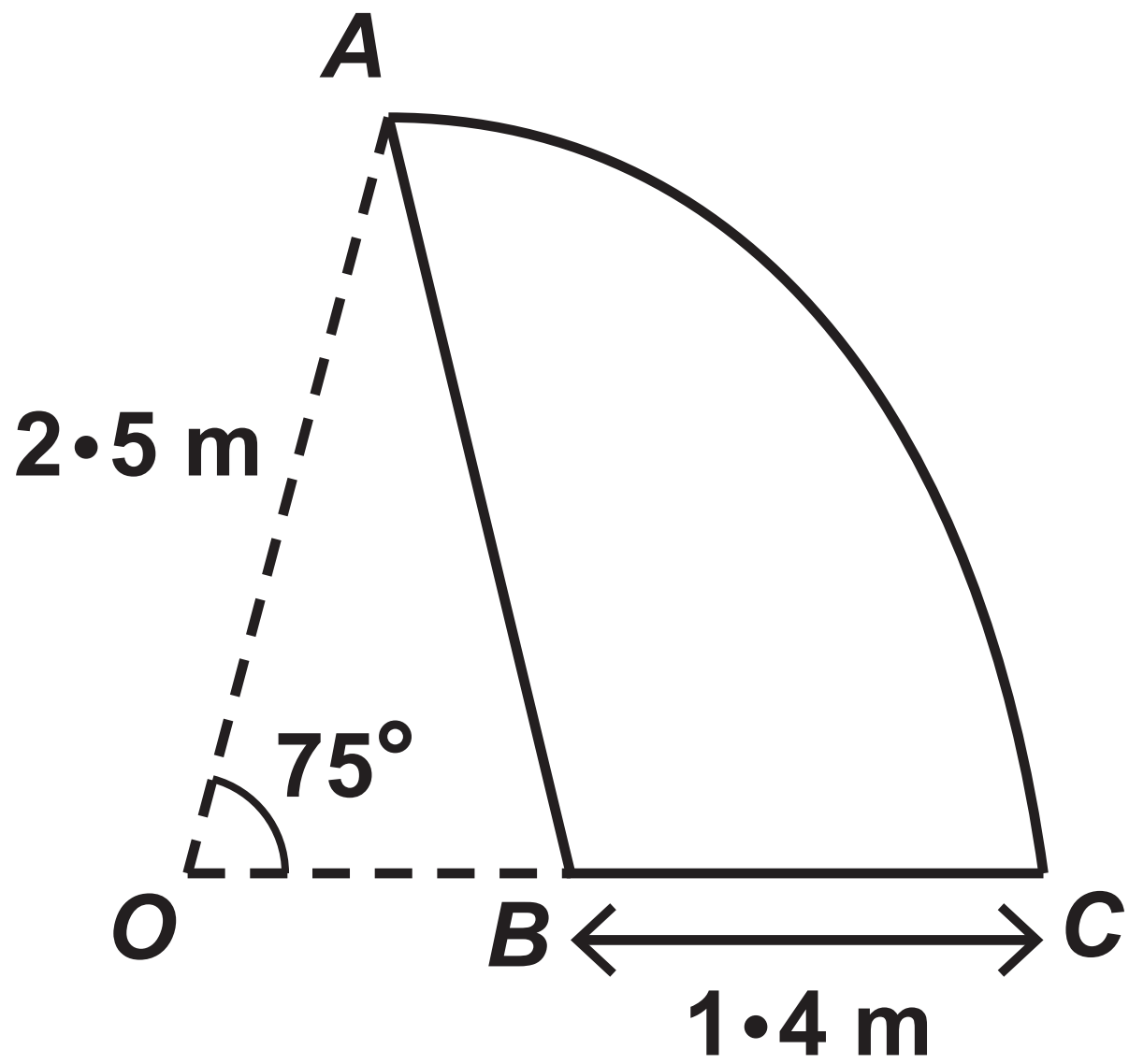
649 133 016 249 585 520 869 239

489 849 727 133 580 337 182 125

957 755 510 563 017 205 810 119

Question 11

Diagram NOT drawn to scale



**GCSE
MATHEMATICS**

and

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MATHEMATICS – NUMERACY



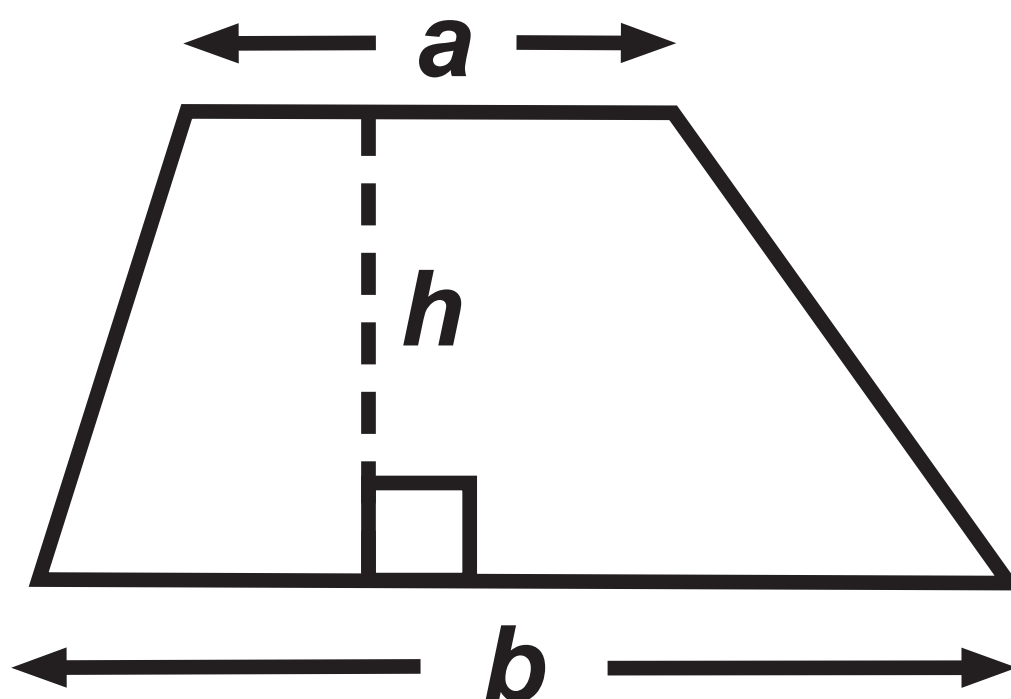
**FORMULA LIST
HIGHER TIER
GCSE**

**You must not write on these formula
pages.**

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

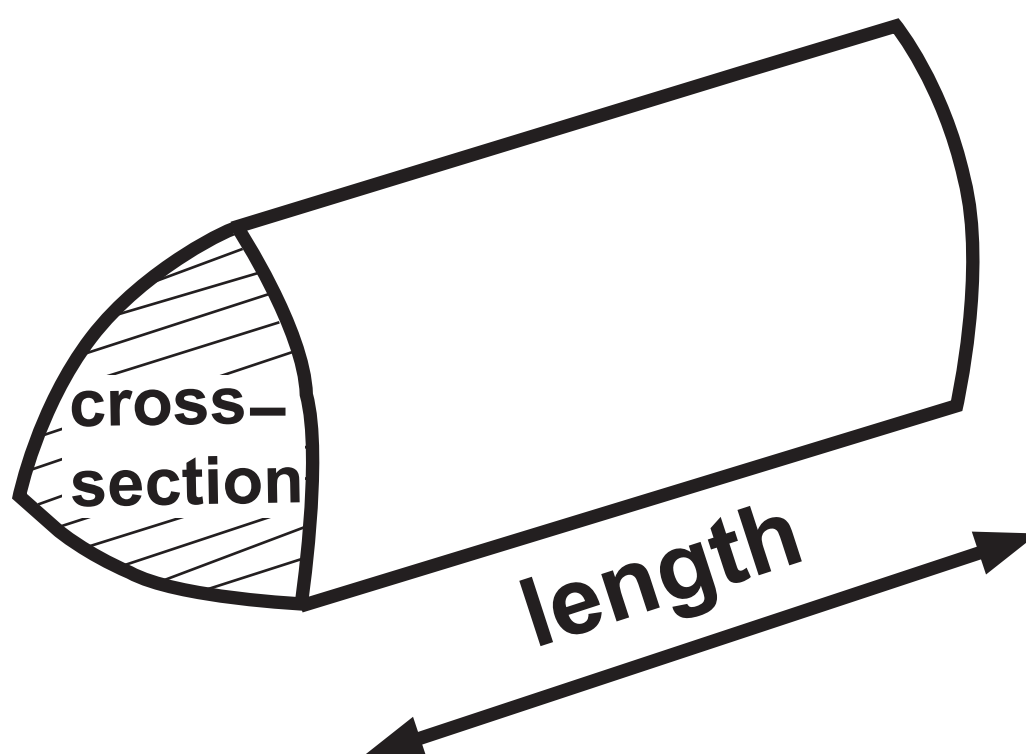
Formula List – Higher Tier

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



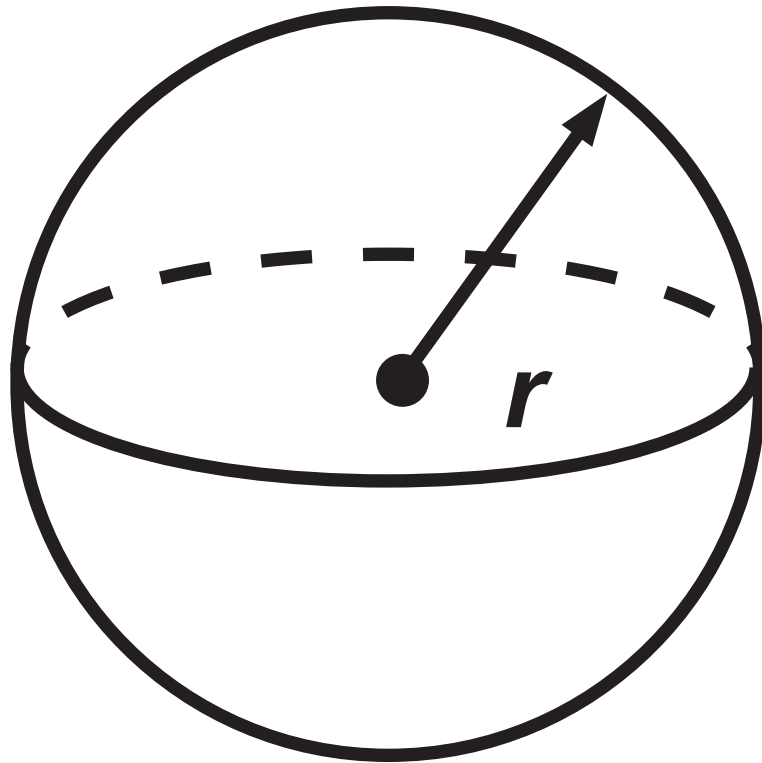
Volume of prism =

area of cross – section $\times$ length



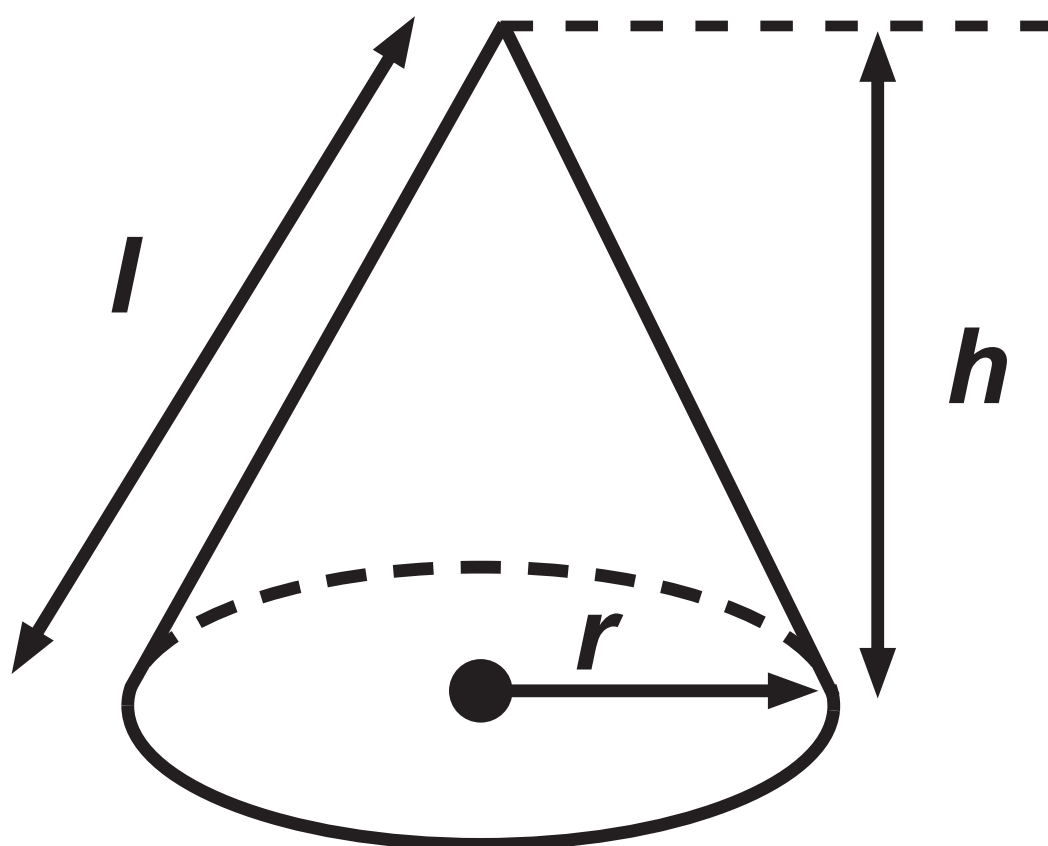
Volume of sphere = $\frac{4}{3}\pi r^3$

Surface area of sphere = $4\pi r^2$

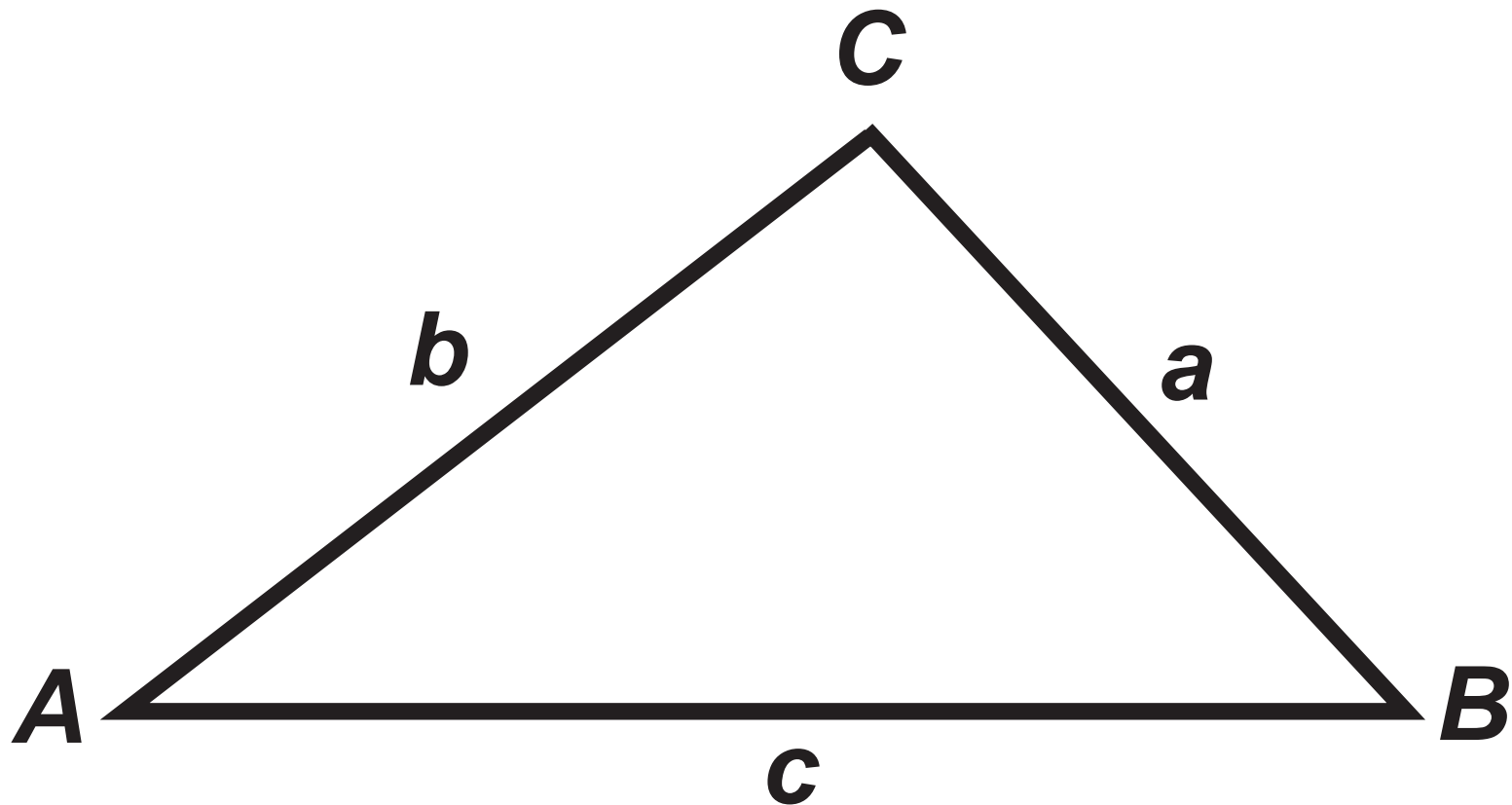


Volume of cone = $\frac{1}{3}\pi r^2 h$

Curved surface area of a cone = $\pi r l$



In any triangle ABC



Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc \cos A$

Area of triangle $= \frac{1}{2}ab \sin C$

The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$

where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Annual Equivalent Rate (AER)

AER, as a decimal, is calculated using

the formula $\left(1 + \frac{i}{n}\right)^n - 1$, where i is the

nominal interest rate per annum as a

decimal and n is the number of

compounding periods per annum.