

Surname	Centre Number	Candidate Number
First name(s)		0



GCSE

3310U50-1



S25-3310U50-1

THURSDAY, 8 MAY 2025 – MORNING

MATHEMATICS – NUMERACY
UNIT 1: NON-CALCULATOR
HIGHER TIER

1 hour 45 minutes

ADDITIONAL MATERIALS

The use of a calculator is not permitted in this examination.
A ruler, a protractor and a pair of compasses may be required.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

You may use a pencil for graphs and diagrams only.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

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

Take π as 3.14.

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.

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	3	
2.	6	
3.	4	
4.	6	
5.	5	
6.	4	
7.	6	
8.	3	
9.	5	
10.	7	
11.	4	
12.	12	
13.	15	
Total	80	

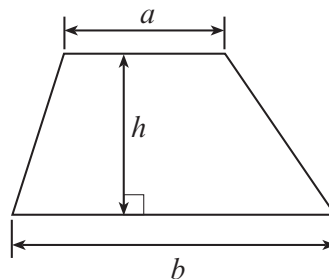
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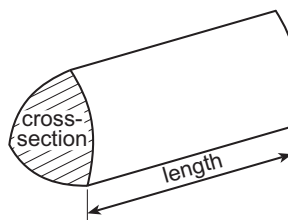
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Formula List – Higher Tier

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

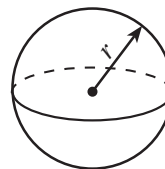


Volume of prism = area of cross-section $\times$ length



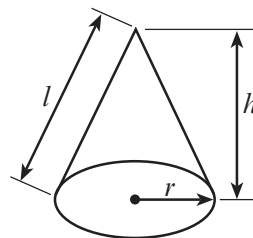
Volume of sphere $= \frac{4}{3} \pi r^3$

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



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

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

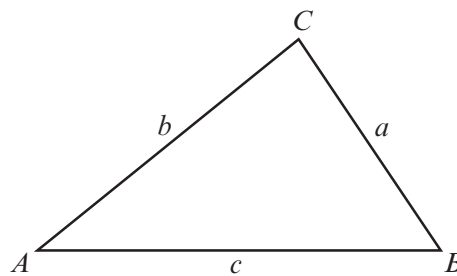


In any triangle ABC

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.



1. The scale drawing below shows a plan of a stage in a theatre.
The stage measures 10 metres by 6 metres.

The scale used is **1 cm represents 1 metre**.

An 'X' will be marked on the stage where a microphone is to be placed.

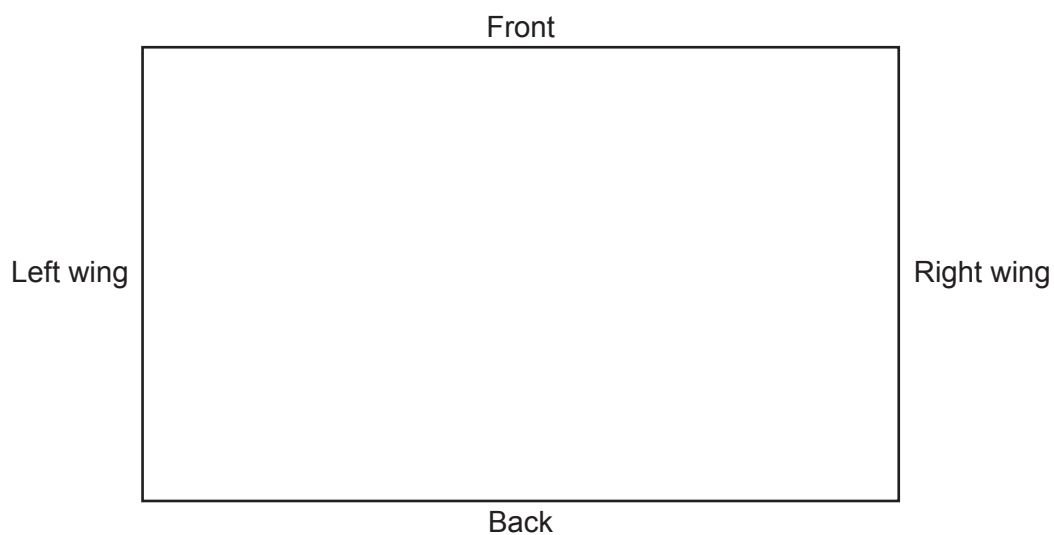
The 'X' must be:

- equidistant from the front of the stage and the right wing
- 2 metres from the front of the stage.

Draw suitable lines on the plan and show where the 'X' will be marked.

[3]

Scale: 1 cm represents 1 metre



2. *In this question, you will be assessed on the quality of your organisation, communication and accuracy in writing.*

Nadya borrowed £500 from a loan company.

The loan company told her that she would pay more than 100% interest.

Nadya paid off the loan and interest completely by paying back £55 each month for 2 years.

What percentage interest did Nadya actually pay?

You must show all your working.

[4 + 2 OCW]

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3. Last year, Jade's total income before tax was €20 000.

The table below shows the tax bands, taxable income and tax rates last year.

Band	Taxable income	Tax rate
Personal allowance	Up to €10 000	0%
Basic rate	€10 000 to €18 000	10%
Higher rate	over €18 000	20%

Calculate Jade's **total** tax bill last year.
You must show all your working.

[4]

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- How long does he spend in the shower?
Give your answer in minutes and seconds.
You must show all your working.

Use: 1 gallon $\approx$ 4.5 litres

Time in the shower is minutes seconds



5. Dafydd and Mia both play musical instruments.

- (a) Dafydd and his mum share the cost of buying a saxophone in the ratio 3 : 7.

His mum's share of the cost is £280.

How much will this saxophone cost to buy?

[3]



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- (b) Mia takes her violin to be valued every year.

This year, it is valued at £660.

The violin has increased in value by 20% from last year.

Calculate how much Mia's violin was worth last year.

[2]



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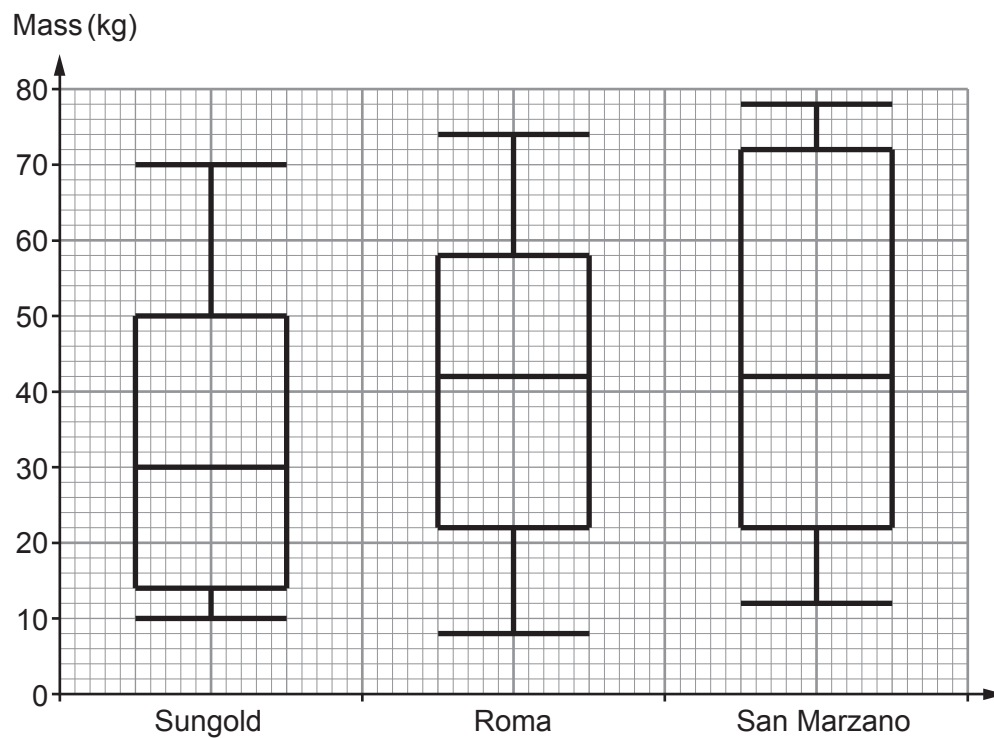
6. Kendrick Nurseries grow tomatoes to sell to supermarkets.

They grow three varieties: Sungold, Roma and San Marzano.

The head gardener recorded the mass of tomatoes from each of 500 plants for each of the three varieties.



The box-and-whisker diagrams below show the masses of the tomatoes.



- (a) What is the range of the masses for the Sungold tomato plants?

[1]

Range is kg



- (b) How many of the Roma plants produced 22 kg or less of tomatoes? [2]

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- (c) The box-and-whisker diagrams show that two of the varieties have the same lower quartile mass.

Which one of these two varieties produces tomatoes that seem to have a more consistent mass?

Variety of tomato is

Which one of these measures could you use to help you decide?
Circle your answer.

[1]

Mode

Median

Mean

Interquartile range

Greatest mass



7. The diagram shows Davina's garden.

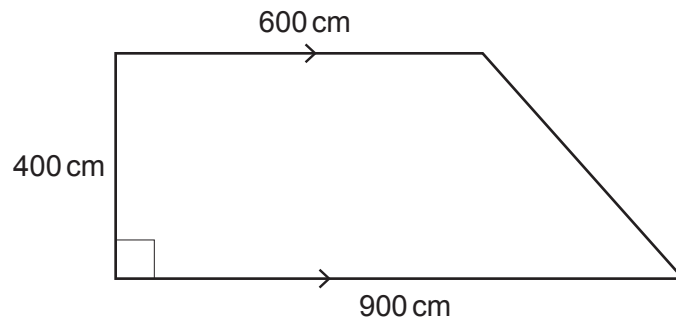


Diagram not drawn to scale

- (a) Davina wants to put a 5 cm layer of topsoil on her garden.

What volume of topsoil will Davina need for her garden?
Give your answer in cm^3 in **standard form**.

[5]

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- (b) Topsoil is sold in $1.5 \times 10^4 \text{ cm}^3$ bags.
Calculate the number of bags of topsoil that Davina needs to buy.
You must show all your working.

[1]

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- A right triangular prism is shown. The base is a right-angled triangle with a vertical leg of 4 cm and a horizontal leg of 3 cm. The hypotenuse is labeled 5 cm. The length of the prism is indicated by a dashed line and labeled "Length".

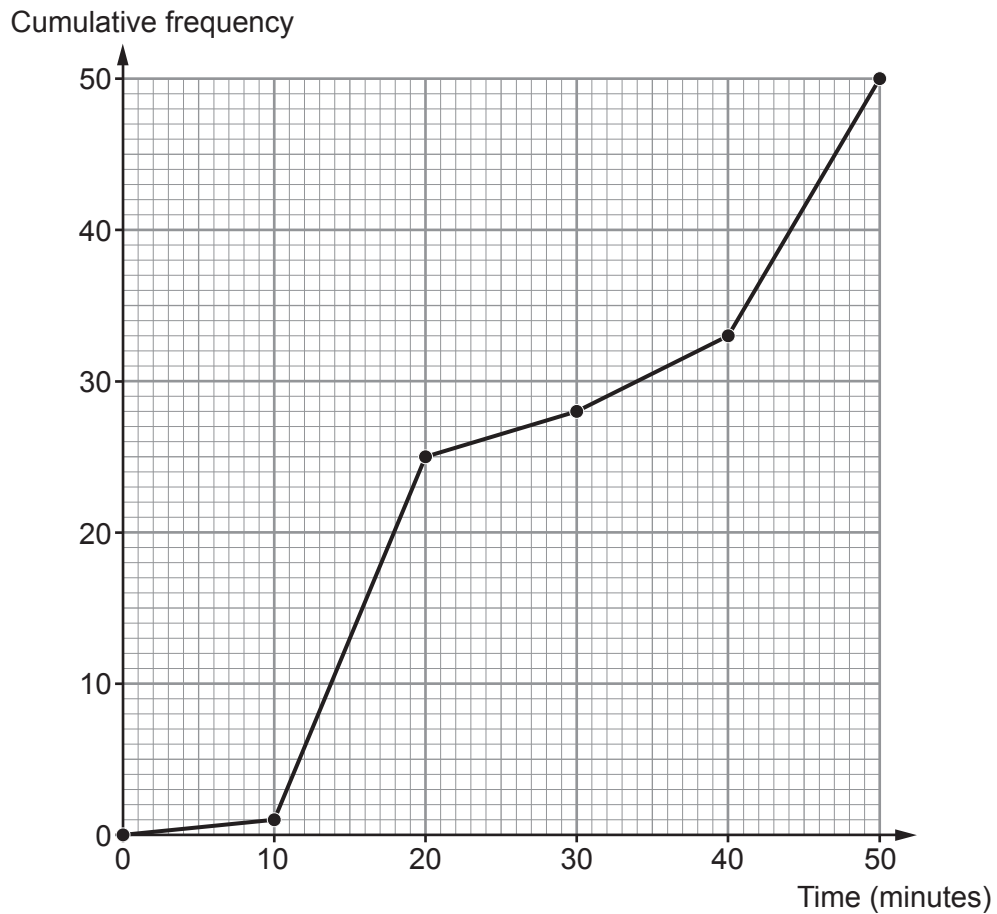
The volume of the triangular prism is 546 cm^3 .
Calculate the width of the door.
You must show all your working.

[3]



9. Aled is a gardener.
In April, he records how many minutes he spends working in each of his customers' gardens.

He draws a cumulative frequency diagram to display the findings.



- (a) Find the median time that Aled spends working in the garden for these customers. [1]

Median is minutes



- (b) For how many customers did Aled spend between 10 and 30 minutes working in their garden? [1]

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..... customers

- (c) For 70% of his customers, Aled thinks that he spends less than 40 minutes working in their garden.
Is Aled correct?
You must show all your working. [3]

Aled is correct

☐

Aled is not correct

☐

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10. (a) In 2020, red squirrels were introduced into a woodland in Wales.

The following formula is used to calculate how many red squirrels there are in the woodland,

$$R = 200 \times 1.1^t$$

where:

- R is the number of red squirrels in the woodland
- t is the number of years after the red squirrels were introduced.



- (i) How many red squirrels were introduced in 2020?

[1]

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- (ii) Calculate the **percentage** increase in the number of red squirrels 2 years after they were introduced.

[3]

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- (b) Workers are making a new area of woodland.
4 workers planted 15 000 trees in 3 days.
How many workers will be needed to plant another 17 500 trees in 2 days?
You can assume that all workers plant trees at the same rate.

[3]

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11.



Harri and Alys are learning about diluting liquids.

They mix 300 ml of water with 200 ml of acetic acid to make 500 ml of diluted acetic acid.

Water has a density of 1 g/ml.

Acetic acid has a density of 1.05 g/ml.

Calculate the density of the diluted acetic acid that Harri and Alys have made.

Give your answer as a decimal.

[4]

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Density of the diluted acetic acid is g/ml



12. Afan is an online company that employs 400 staff in four different job types.

(a) The table below shows the total number of staff in each job type.

Job type	Management	Office	Warehouse	Delivery
Number of staff	39	82	227	52

Afan wants to carry out a survey of its staff to find out about staff well-being.
The survey will be given to a sample of 100 staff.

Use stratified sampling to calculate the number of staff from each job type who should
be asked to complete the survey.
You must show all your working. [4]

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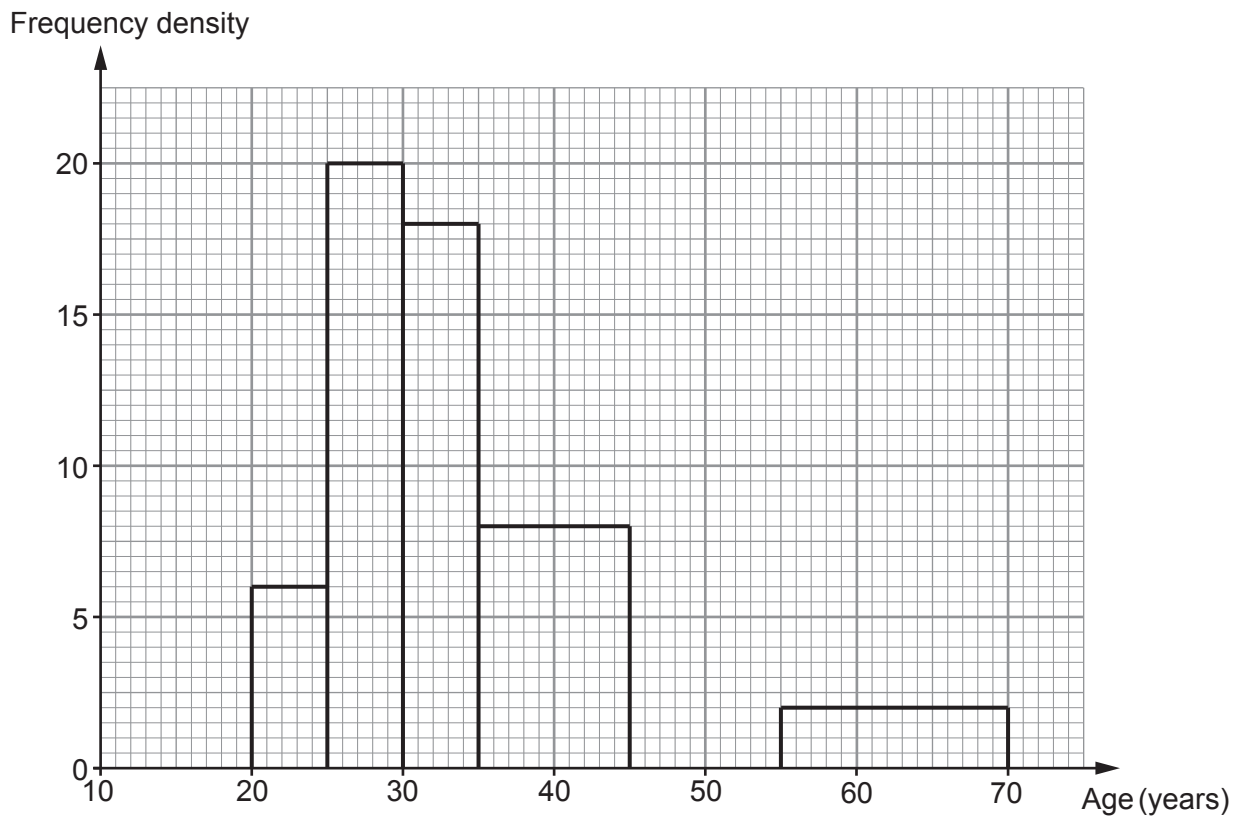
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Job type	Management	Office	Warehouse	Delivery
Number in sample				



- (b) The youngest member of staff is aged 20, and the oldest member of staff is aged 69. This histogram below shows the ages of some of Afan's staff.



- (i) How many staff does the histogram currently show?

[2]

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- (ii) Afan employs a total of 400 staff.
The bar for the group $45 \leq \text{age} < 55$ is missing from the histogram.
Complete the histogram.

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- (iii) Use the histogram to calculate an estimate of the lower quartile of the ages of Afan's staff. [3]

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- (iv) Sunila is a member of Afan's staff.
Sunila says,

"I am 27 years old. I think I'm in the lowest 25% of the ages of Afan's staff."

Is Sunila's age in the lowest 25%?

Yes

☐

No

☐

Can't tell

☐

Give a reason for your answer.

[1]

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13. Pizza-Rea is a company that makes outdoor pizza ovens.

- (a) The diagram below shows the design for the metal front plate of its latest pizza oven.

The front of the oven is symmetrical.

It has a rectangular hole, through which pizzas are placed in the oven.

Pizza-Rea wants to calculate an estimate of the area of the metal used for this front plate.

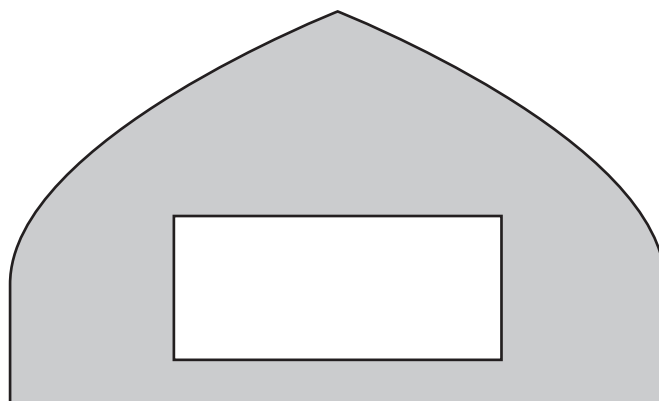


Diagram not drawn to scale

The diagram below is a sketch of the front plate of the pizza oven drawn on coordinate axes.

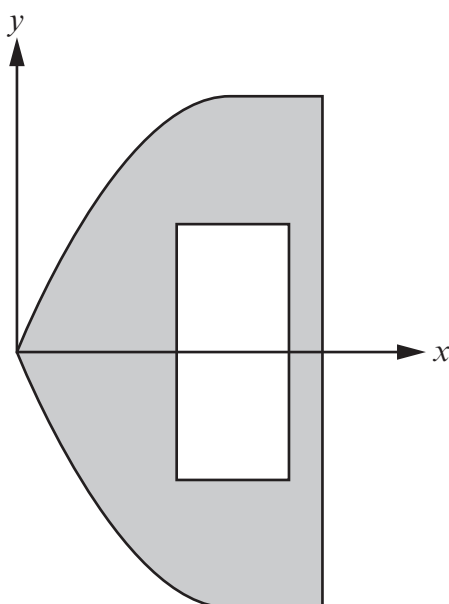
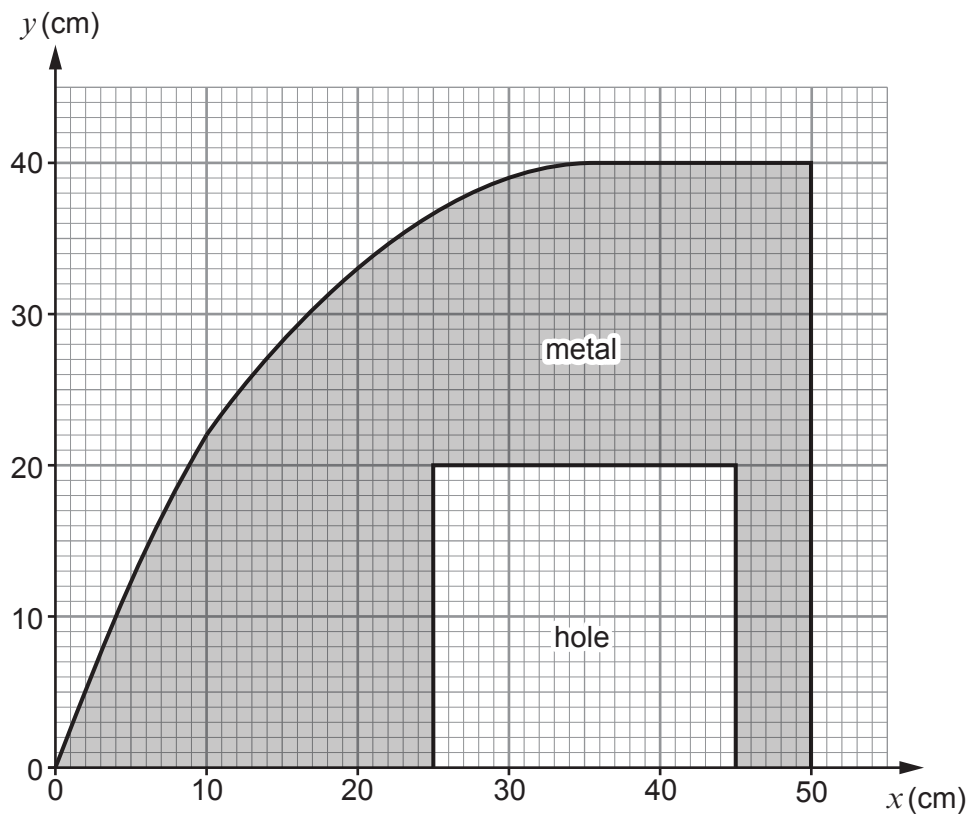


Diagram not drawn to scale



Pizza-Rea have accurately drawn **one** of the symmetrical halves of the front plate on graph paper.



Using 5 strips of equal width, calculate an estimate of the area of metal shown in the graph.

Hence calculate the total area of metal in the **complete** front plate.

[5]

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- (b) Pizzas are cooked in the inner part of the pizza oven.
The inner part is in the shape of a half-cylinder.

A hole is needed in the top of the oven to let hot air out.
The straight-line distance from the centre of this hole to either of the front bottom corners of the oven should be less than 50 cm.

The dotted line, AB , in the diagram below represents one of these straight-line distances.

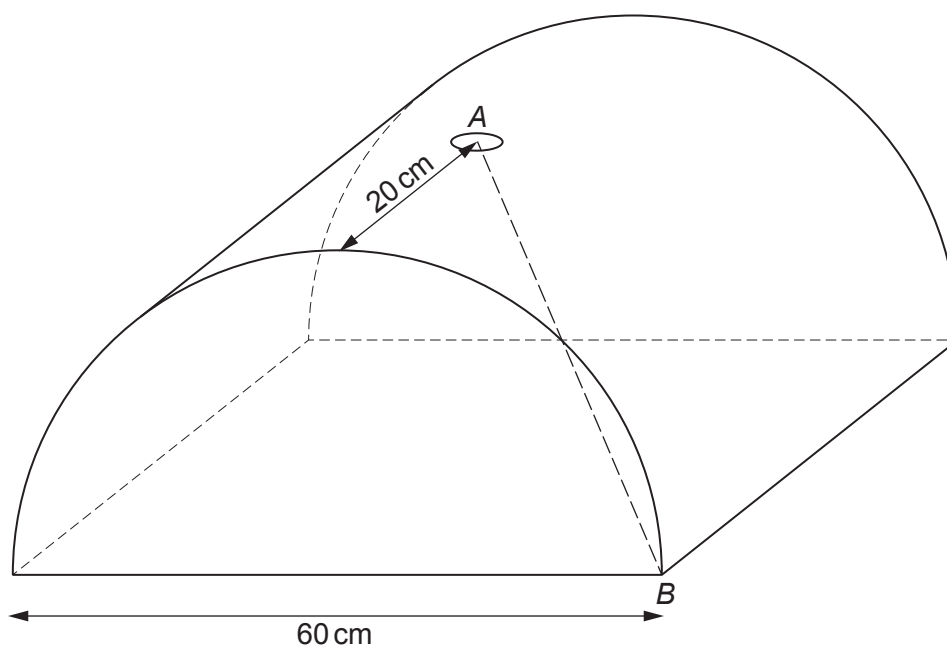


Diagram not drawn to scale

Show that the distance from A to B is less than 50 cm.

[4]

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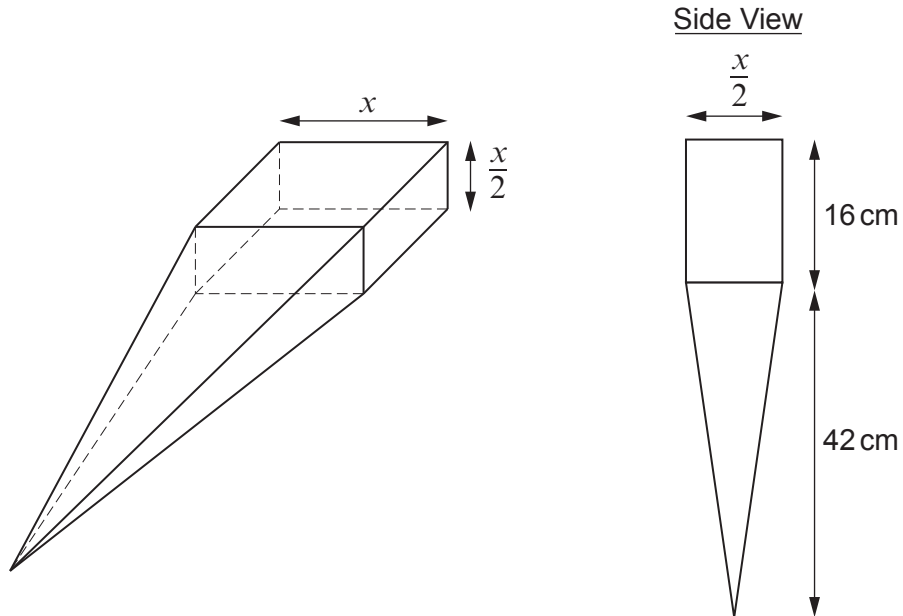
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- (c) Pizza-Rea supplies spiked legs for the pizza oven. Each leg is made by connecting a cuboid to a pyramid. The perpendicular height of the pyramid is 42 cm. The diagrams below show the design of the spiked legs.



Diagrams not drawn to scale

The volume of each leg is 750 cm^3 .

Calculate the length x .

Give your answer in the form $a\sqrt{b}$, where a and b are integers and b is as small as possible.

[6]



Examiner
only

