FOR OFFICIAL USE

G

	KU	RE
Total marks		

2500/403

NATIONAL QUALIFICATIONS 2007

THURSDAY, 3 MAY
10.40 AM – 11.15 AM

MATHEMATICS STANDARD GRADE

General Level
Paper 1
Non-calculator

Fill in these boxes and read what is printed below.

Full name of centre

Town

Forename(s)

Surname

Date of birth
Day Month Year

Scottish candidate number

Number of seat

1 **You may <u>not</u> use a calculator.**

2 Answer as many questions as you can.

3 Write your working and answers in the spaces provided. Additional space is provided at the end of this question-answer book for use if required. If you use this space, write clearly the number of the question involved.

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LI 2500/403 6/68370

FORMULAE LIST

Circumference of a circle: $C = \pi d$

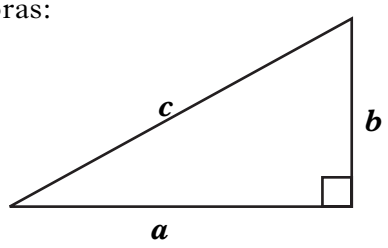
Area of a circle: $A = \pi r^2$

Curved surface area of a cylinder: $A = 2\pi rh$

Volume of a cylinder: $V = \pi r^2 h$

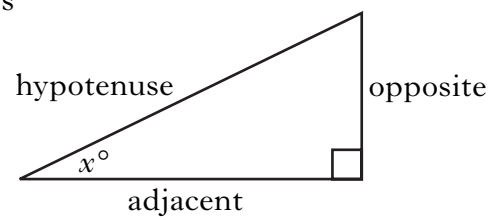
Volume of a triangular prism: $V = Ah$

Theorem of Pythagoras:



$$a^2 + b^2 = c^2$$

Trigonometric ratios in a right angled triangle:



$$\textbf{tan } x^\circ = \frac{\textbf{opposite}}{\textbf{adjacent}}$$

$$\textbf{sin } x^\circ = \frac{\textbf{opposite}}{\textbf{hypotenuse}}$$

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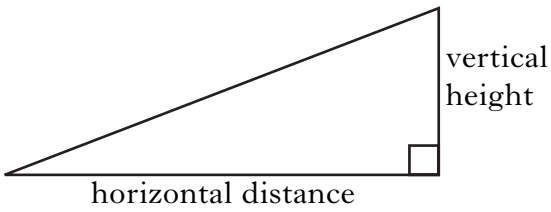
Gradient:



$$\textbf{Gradient} = \frac{\textbf{vertical height}}{\textbf{horizontal distance}}$$

DO NOT WRITE IN THIS MARGIN

Marks	KU	RE

1. Carry out the following calculations.

(*a*) $4{\cdot}27 - 1{\cdot}832$

1

(*b*) $6{\cdot}53 \times 40$

1

(*c*) $372 \div 8$

1

(*d*) $5 \times 4\frac{1}{3}$

2

2. A particle is radioactive for $2{\cdot}3 \times 10^{-4}$ seconds.
Write this number in full.

2

DO NOT WRITE IN THIS MARGIN

Marks | KU | RE

3. Zoe is a member of a gym.

The gym offers the following exercise sessions.

Exercise	Session Time
Weights	15 minutes
Dance	40 minutes
Running	20 minutes
Cycling	30 minutes
Swimming	45 minutes

Zoe is advised to choose **three** different exercises.

She wants to exercise for a **minimum of 90 minutes**.

One possible combination of three different exercises is shown in the table below.

Complete the table to show all the possible combinations of three different exercises Zoe can choose.

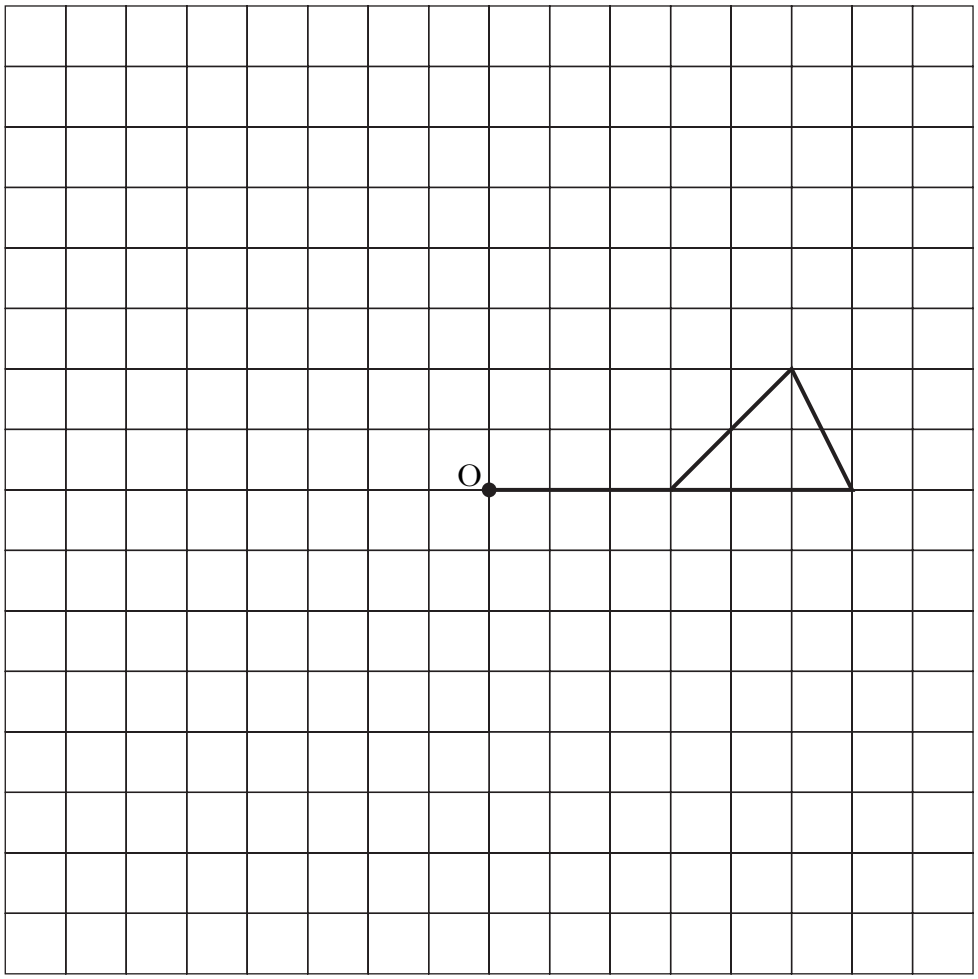
Weights	Dance	Running	Cycling	Swimming	Total Time (minutes)
		✓	✓	✓	95 minutes

3

DO NOT WRITE IN THIS MARGIN

Marks	KU	RE

4. Complete this shape so that it has quarter-turn symmetry about O.



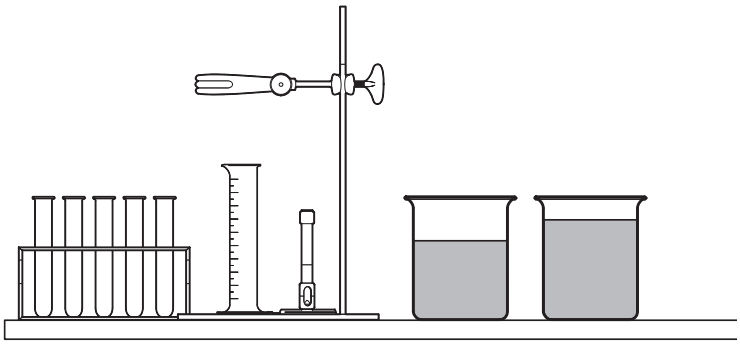
3

[Turn over

DO NOT WRITE IN THIS MARGIN

Marks	KU	RE

5. In an experiment Rashid measures the temperature of two liquids.



The temperature of the first liquid is –11 ° Celsius.

The temperature of the second liquid is 23 ° Celsius.

Find the difference between these temperatures.

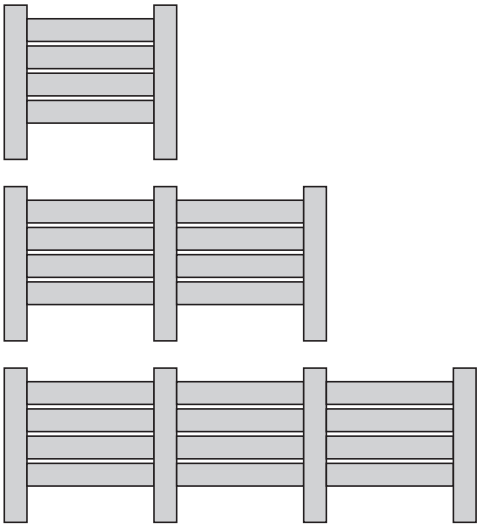
2

DO NOT WRITE IN THIS MARGIN

Marks	KU	RE

6. A children's play area is to be fenced.

The fence is made in sections using lengths of wood, as shown below.



1 section

2 sections

3 sections

(*a*) Complete the table below.

Number of sections (s)	1	2	3	4	5		12
Number of lengths of wood (w)	6	11					

2

(*b*) Write down a formula for calculating the number of lengths of wood (w), when you know the number of sections (s).

2

(*c*) A fence has been made from 81 lengths of wood.

How many sections are in this fence?

You must show your working.

2

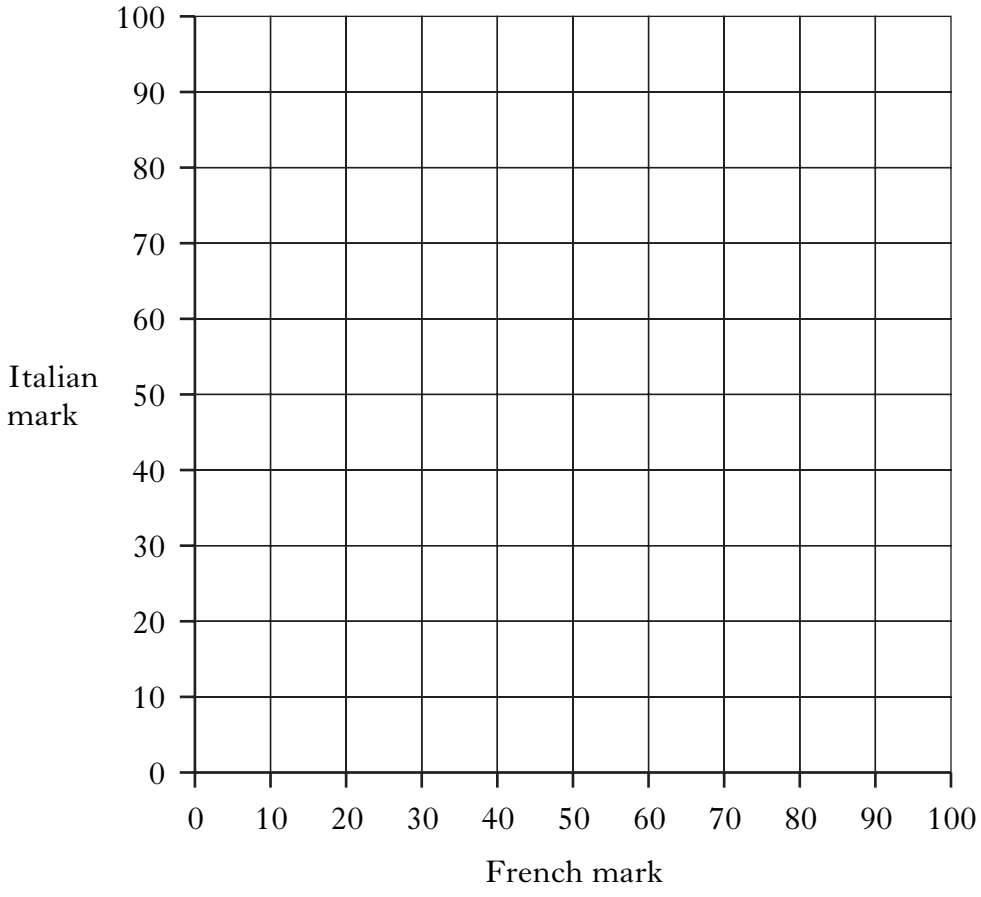
DO NOT WRITE IN THIS MARGIN

Marks | KU | RE

7. The table below shows the marks scored by pupils in French and Italian exams.

Pupil	A	B	C	D	E	F	G	H
French Mark	15	23	50	38	40	42	70	82
Italian Mark	28	31	62	54	45	55	85	95

(*a*) Using these marks, draw a scattergraph. **2**



(*b*) Draw a best-fitting line on the graph. **1**

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Marks	KU	RE

7. (continued)

(*c*) A pupil who scored 65 in his French exam was absent from the Italian exam.

Use your best-fitting line to estimate this pupil's Italian mark.

1

8. Pamela sees a bracelet costing £65 in a jeweller's window.

The jeweller offers Pamela a 5% discount.

Pamela decides to buy the bracelet.

How much does she pay?

3

DO NOT WRITE IN THIS MARGIN

Marks | KU | RE

9. Craig works in the school office.

Shown below is his order for 25 boxes of folders.

Office Supplies	
Blue Folders	7 boxes
Green Folders	11 boxes
Pink Folders	3 boxes
Yellow Folders	4 boxes
Total	**25 boxes**

His order has arrived in identical boxes but they are not labelled.

(*a*) What is the probability that the first box Craig opens contains pink folders?

1

(*b*) The first box Craig opens contains green folders.

What is the probability that the next box he opens contains blue folders?

2

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Marks	KU	RE

10. There are 720 pupils in Laggan High School.
The ratio of boys to girls in the school is 5 : 4.
How many girls are in the school?

3

[*END OF QUESTION PAPER*]

ADDITIONAL SPACE FOR ANSWERS

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NATIONAL QUALIFICATIONS 2007

THURSDAY, 3 MAY
11.35 AM – 12.30 PM

MATHEMATICS STANDARD GRADE

General Level
Paper 2

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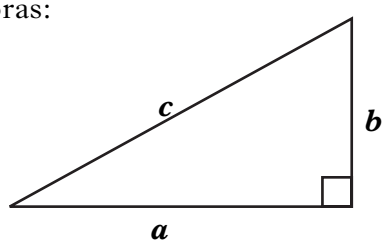

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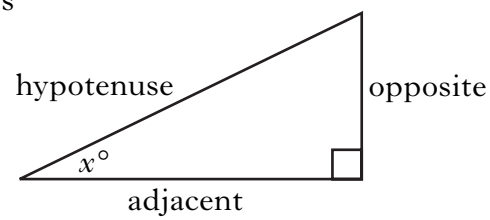

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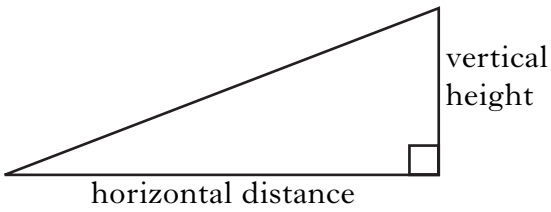

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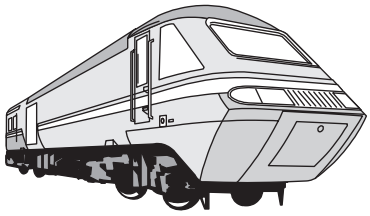
Marks	KU	RE

1. A Sprinter train travels at an average speed of 144 kilometres per hour.

The train takes 1 hour 15 minutes to travel between Dingwall and Aberdeen.

Calculate the distance between Dingwall and Aberdeen.



2

[Turn over

DO NOT WRITE IN THIS MARGIN

Marks	KU	RE

2. Mr McGill is a bricklayer.

He builds a wall using 7500 bricks:

- each brick costs 23 pence
- a charge of £200 is made for every 500 bricks he lays.

What is the **total** cost of building the wall?

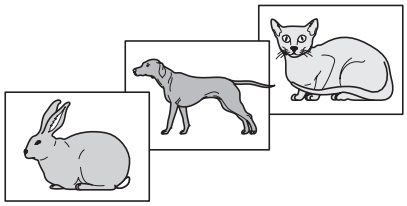
3

DO NOT WRITE IN THIS MARGIN

Marks	KU	RE

3.

Belmont Vets
Check-up Fees



Dog	**£17·50**
Cat	**£11·75**
Rabbit	**£7·95**

The Wilson family owns two dogs and a cat.

Last year each dog had two check-ups at Belmont Vets.

The family cat also had check-ups last year.

The Wilson's total check-up fees for the two dogs and the cat were £105·25.

How often did the cat have a check-up?

4

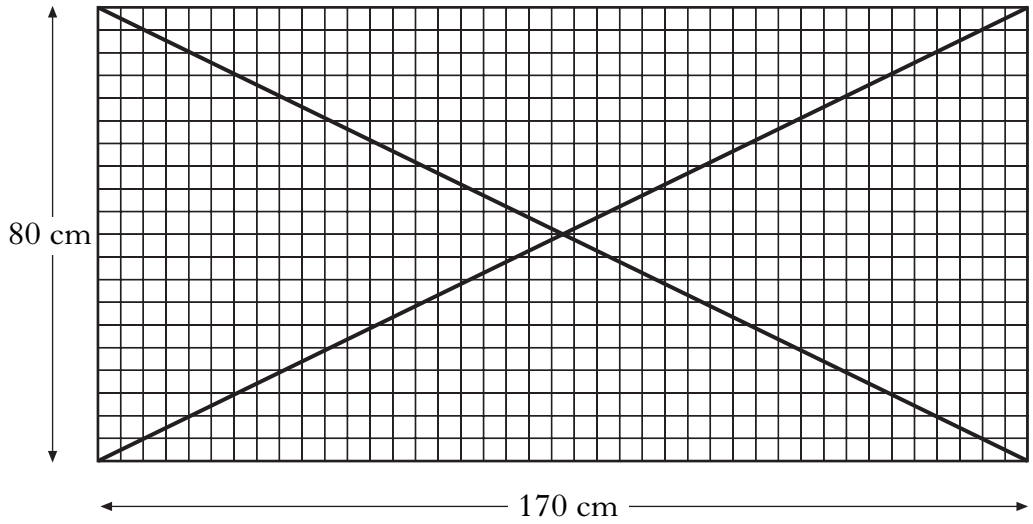
[Turn over

DO NOT WRITE IN THIS MARGIN

Marks | KU | RE

4. A rectangular metal grill for a window is shown below.

Two diagonal metal bars strengthen the grill.



Find the length of one of the metal bars.

Round your answer to the nearest centimetre.

Do not use a scale drawing.

4

DO NOT WRITE IN THIS MARGIN

Marks	KU	RE

5. (*a*) Simplify

$$2(3x + 7) + 4(3 - x).$$

3

(*b*) Solve the inequality

$$4a - 3 \geq 21.$$

2

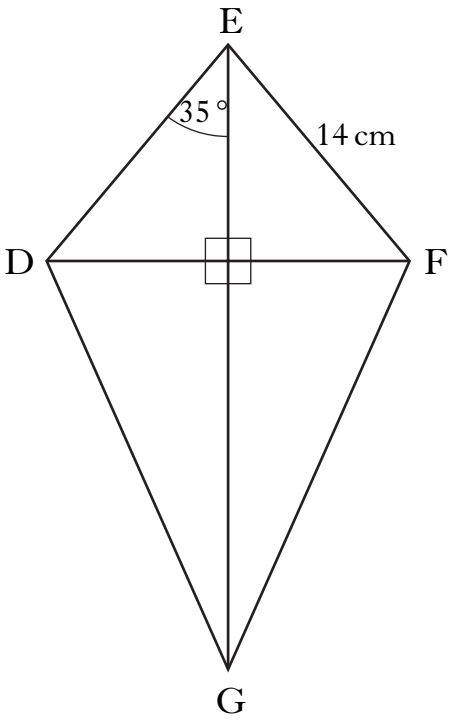
[Turn over

DO NOT WRITE IN THIS MARGIN

Marks | KU | RE

6. DEFG is a kite:

- angle DEG = 35 °
- EF = 14 centimetres.



Calculate the length of DF.

4

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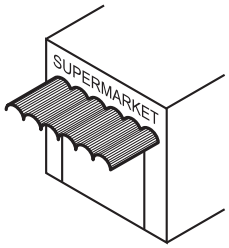
7. A supermarket has a canopy over its entrance.



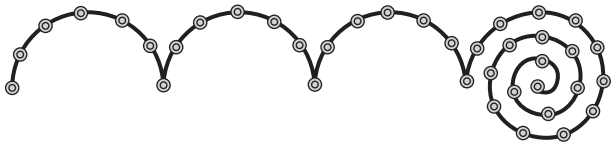
The edge of the canopy has 6 semicircles as shown below.

Each semicircle has a diameter of 4 metres.

(*a*) Find the length of the curved edge of **one of the semicircles**.

2

(*b*) Tony attaches fairy lights to the edge of the canopy.



He has 40 metres of fairy lights.

Is this enough for the whole canopy?

Give a reason for your answer.

2

DO NOT WRITE IN THIS MARGIN

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8.

Sally invests £4200 in the Platinum Saver Account which pays 6·3% interest per annum.

How much simple interest will she receive after 10 months?

3

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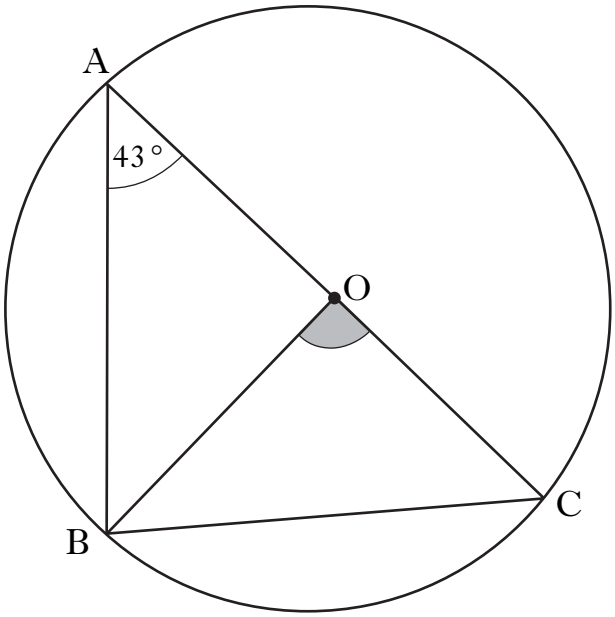
9. In the diagram:

- O is the centre of the circle
- AC is a diameter
- B is a point on the circumference
- angle BAC = 43 °.

Calculate the size of shaded angle BOC.



3

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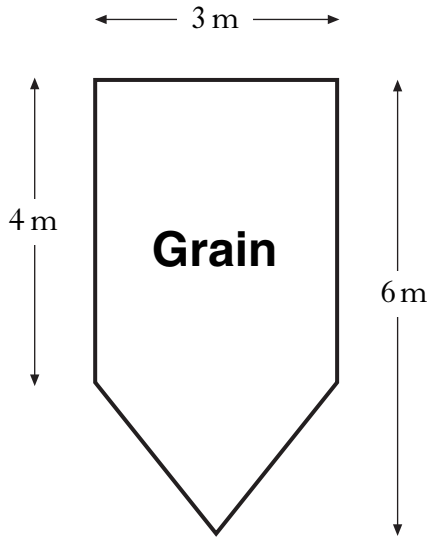
Marks | KU | RE

10. The end face of a grain hopper is shown in the diagram.

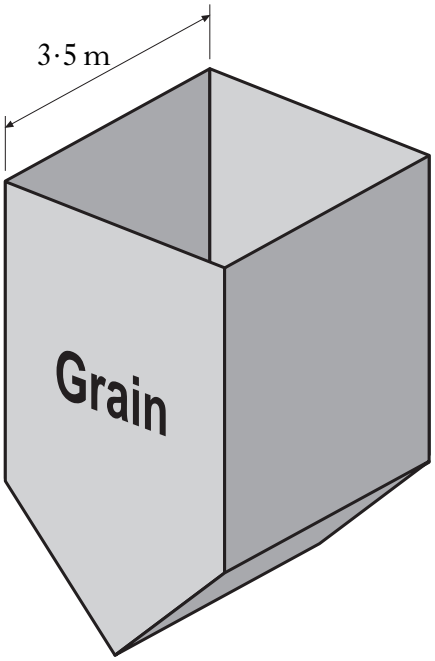


(*a*) Calculate the area of the end face.

3

(*b*) The grain hopper is in the shape of a prism with a length of 3·5 metres.

Find the volume of the hopper.



2

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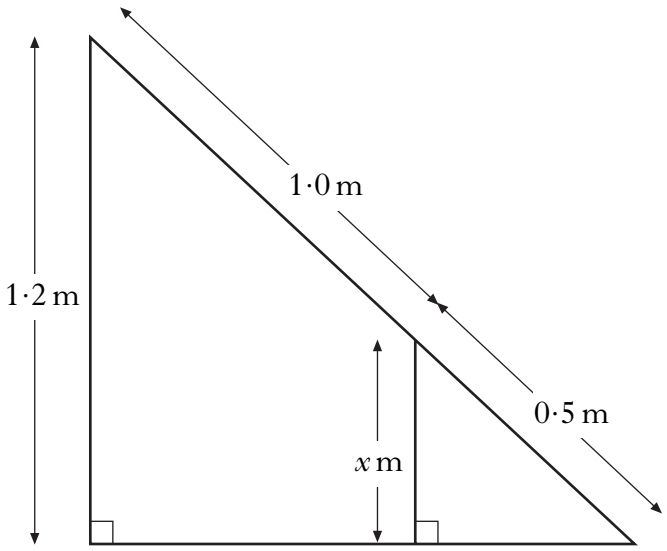
11. The diagram below shows the design for a house window.



Find the value of x.

3

[Turn over for Question 12 on *Page fourteen*

DO NOT WRITE IN THIS MARGIN

Marks	KU	RE

12. The burning time, t minutes, of a candle varies directly as its height, h millimetres.

A candle with a height of 75 millimetres burns for 180 minutes.

(*a*) What is the burning time of a 40 millimetre candle?

3

(*b*) A candle burns for $2\frac{1}{2}$ hours.

What is the height of this candle?

3

[*END OF QUESTION PAPER*]

ADDITIONAL SPACE FOR ANSWERS

ADDITIONAL SPACE FOR ANSWERS