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G

	KU	RE
Total marks		

2500/403

NATIONAL QUALIFICATIONS 2001

WEDNESDAY, 16 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 not 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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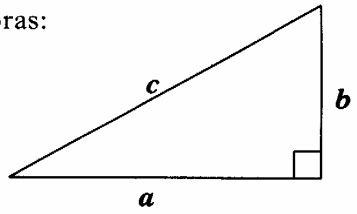
SCOTTISH QUALIFICATIONS AUTHORITY

FORMULAE LIST

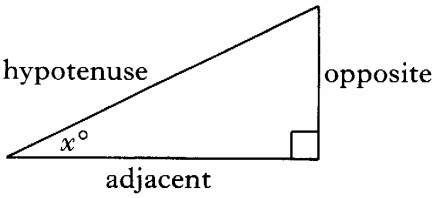
Circumference of a circle:	$C = \pi d$
Area of a circle:	$A = \pi r^2$
Curved surface area of a cylinder:	$A = 2\pi rh$
Volume of a cylinder:	$V = \pi r^2 h$
Volume of a triangular prism:	$V = Ah$

Theorem of Pythagoras:



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

Trigonometric ratios in a right angled triangle:

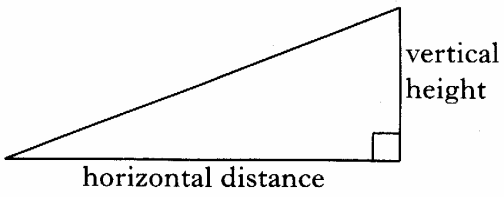


$$\tan x^\circ = \frac{\text{opposite}}{\text{adjacent}}$$

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

$$\cos x^\circ = \frac{\text{adjacent}}{\text{hypotenuse}}$$

Gradient:



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

DO NOT WRITE IN THIS MARGIN

Marks	KU	RE

1. **Work out the following.**

(*a*) $18{\cdot}54 + 0{\cdot}61 - 5{\cdot}3$

1

(*b*) $3{\cdot}36 \times 70$

1

(*c*) $0{\cdot}296 \div 4$

1

(*d*) $\frac{3}{4}$ of 480 g

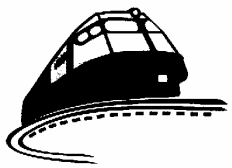
2

[Turn over

DO NOT WRITE IN THIS MARGIN

Marks | KU | RE

2.



A student pays a train fare of £24.

If this represents 60% of the full adult fare, what is the full adult fare?

3

3. Brian checks the five day weather forecast for Paris.

PARIS – FORECAST for 15 January			
	Maximum (°C)	Minimum (°C)	
Saturday	3	−3	Cloudy
Sunday	2	0	Sunny
Monday	7	4	Cloudy
Tuesday	7	2	Sunny
Wednesday	5	−2	Sunny

Calculate the **mean** minimum temperature for the five day weather forecast.

3

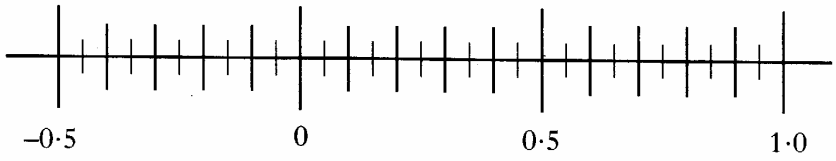
DO NOT WRITE IN THIS MARGIN

Marks	KU	RE

4. (*a*) **Write the number** $1{\cdot}5 \times 10^{-1}$ **in full.**

1

(*b*) Mark the position of this number on the number line below.



1

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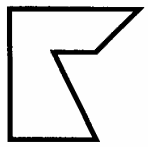
DO NOT WRITE IN THIS MARGIN

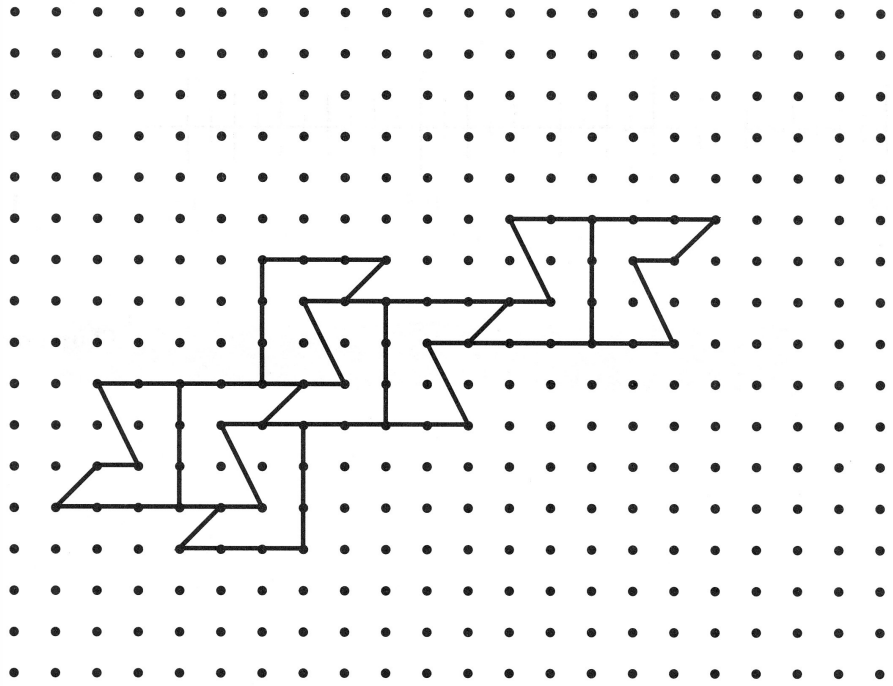
Marks	KU	RE

5. A seaside promenade is to be covered with tiles.

All the tiles are shaped like this.



Here is part of the design of tiles.



Draw six more tiles to continue the design. **3**

DO NOT WRITE IN THIS MARGIN

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6. **Two trains run** from Aberdeen to London Kings Cross.

They both have **the same journey time.**

	Train 1	**Train 2**
Aberdeen *Depart*	1455	2125
Kings Cross *Arrive*	2229	

Find the arrival time for Train 2 at Kings Cross.

3

[Turn over

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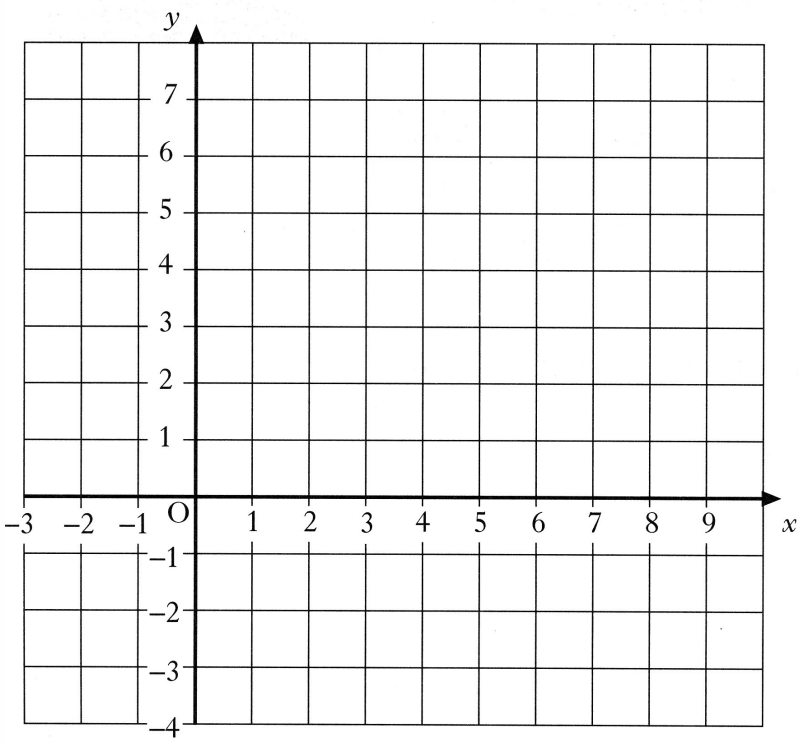
Marks	KU	RE

7. (*a*) Plot the points A (4,6) and C (4,–2) on this grid.



1

(*b*) ABCD is a rhombus with area 24 square units.
Plot B and D on the grid.

3

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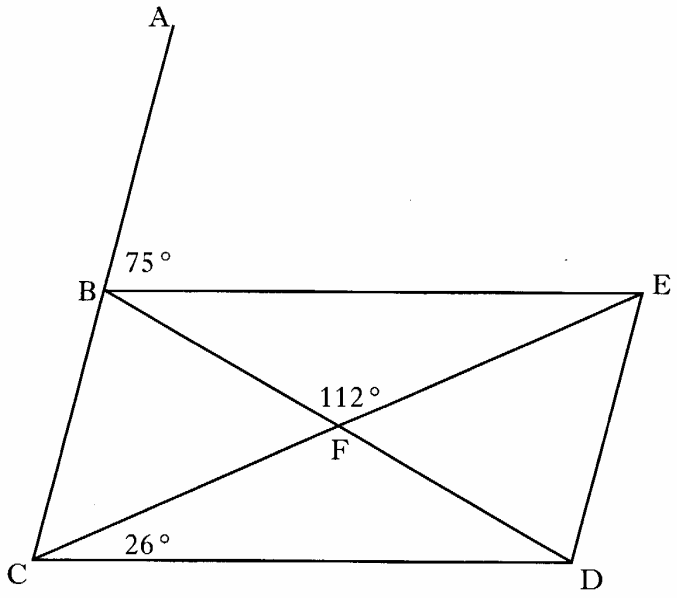
8.



BCDE is a parallelogram.

Angle ABE = 75°, angle ECD = 26°, angle BFE = 112°.

Calculate the size of the angle CBD.

3

[Turn over

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9. There are 1 blue, 2 red and 3 yellow counters in a bag.

(*a*) A counter is taken from the bag.

What is the probability that the counter is red?

1

(*b*) The counter is replaced in the bag and two green counters are added to the bag.

A counter is taken from the bag.

What is the probability that it is **not** yellow?

2

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10. **At Dunure Tennis and Golf Club, the ratio of tennis players to golfers is 100:350.**

(*a*) Express this ratio in its simplest form.

1

(*b*) The club has been given £16 200.

This money will be divided between the tennis section and the golf section in the same ratio as above.

How much money will be allocated to the tennis section?

3

[END OF QUESTION PAPER]

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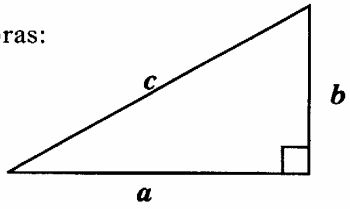

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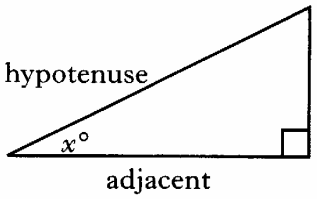

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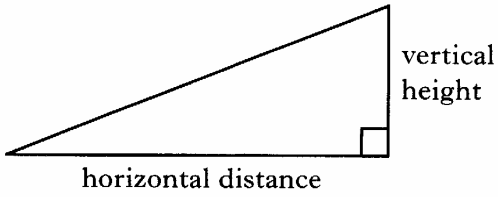

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1. Jayne is 14 years of age and a member of Kelly's Health Club.
She receives details of next year's subscription rates.
They are as follows:

Category of member	*Payment in full*	*Payment by instalments*
Adult	£390	12 payments of £36
Junior (under 16 years of age)	£195	12 payments of £18
Husband and Wife	£695	12 payments of £65

(*a*) Jayne decides to pay by instalments.
How much extra will she pay?

2

(*b*) Express this extra cost as a percentage of the payment in full.
Give your answer correct to 1 decimal place.

3

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Marks	KU	RE

2. The number of passengers travelling by bus from Glasgow to Edinburgh was recorded for 20 journeys.

29	45	36	27	41	38	14
48	31	39	24	17	23	34
29	38	42	12	32	36	

(*a*) Display the information in an ordered stem and leaf diagram.

3

(*b*) Find the median number of passengers.

1

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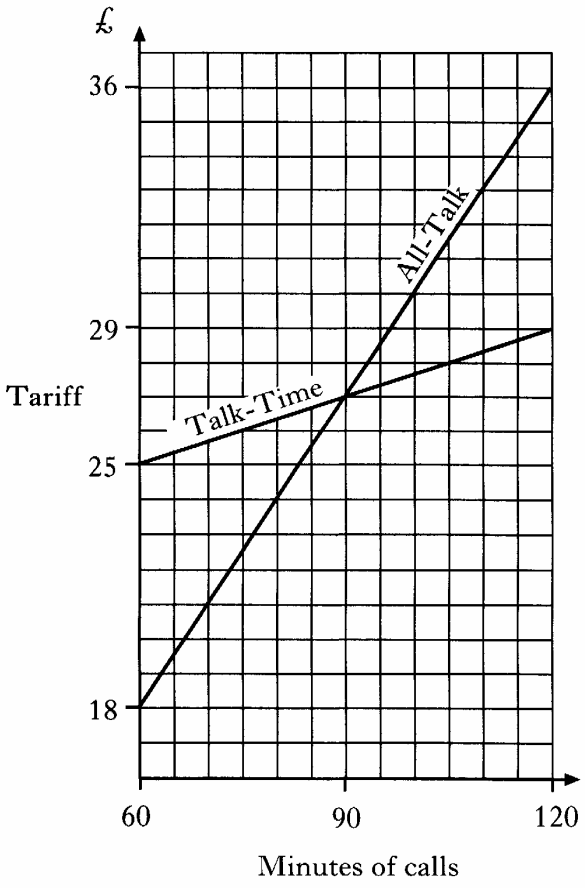
3. Shona is planning to buy a new mobile phone.

She knows that she makes between 60 and 120 minutes of calls each month.

Her local phone shop advises that the "All-Talk" or "Talk-Time" tariff are best for her.

They give her the graph below to help her decide.



Shona chooses the All-Talk tariff.

Comment on her choice.

2

[Turn over

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4. A manufacturer has changed its washing powder so that less powder will be needed for each wash.

As a result the new 1·5 kilogram box gives the same number of washes as the old 2 kilogram box.

A family wash used 96 grams of powder from the old 2 kilogram box.

How much powder will be used for a family wash now?

4		

DO NOT WRITE IN THIS MARGIN

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5. Davina sees this advertisment for CAR HIRE while on holiday in Spain.

UNLIMITED MILEAGE, INSURANCE INCLUDED	
Locus Speedster	3100 pesetas per day
	20 000 pesetas per week
A-Drive Trekcar	5560 pesetas per day
	35 000 pesetas per week
ADD 15% TAX	

She decides to hire the Trekcar for 4 days.

Find the cost, in pounds sterling, of hiring the car if the exchange rate is £1= 256 pesetas.

5

[Turn over

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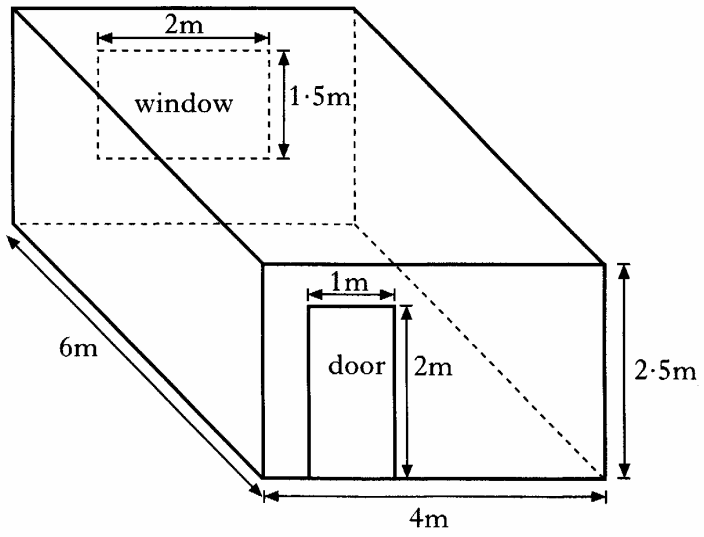
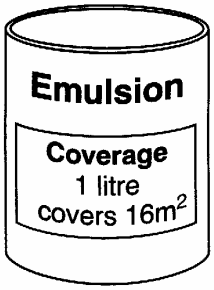
6. Mairi is planning to paint the walls of her room with emulsion paint.

The room is in the shape of a cuboid, with the dimensions shown.



(*a*) How much paint does Mairi need to paint the walls of her room?



2

(*b*) Paint is sold only in 1 litre and 2·5 litre tins.

What will be the minimum cost of painting Mairi's room with emulsion?

2

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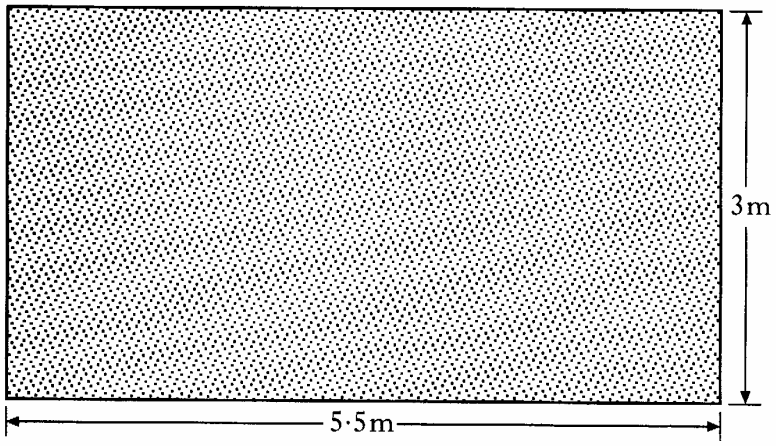
7. John is laying a concrete floor for his garage.

The floor is to be a rectangle 5·5 metres by 3 metres.



To check the floor is rectangular, John measures a diagonal.

What should this measurement be?

3

[Turn over

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8. At the Ewington Athletic Club the length of one lap of the track is 400 metres.

In the 10 000 metres race a runner takes an average of 65·2 seconds to complete each lap.

At this pace, will this runner break the race record of 27 minutes 12 seconds?

4

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9. (*a*) Simplify

$$3\,(2x + 4) + 4\,(x - 2).$$

3

(*b*) Solve algebraically the inequality

$$6x + 2 \leq 20.$$

2

[Turn over

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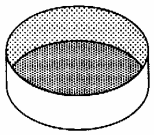
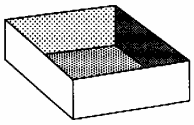
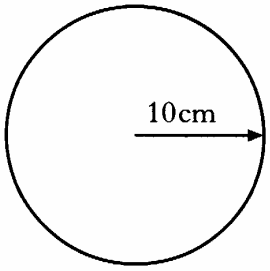
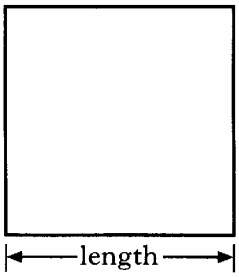
10. The base of a round cake tin has the same area as the base of a square cake tin.

The round cake tin has a radius of 10 centimetres.









What is the length of the base of the square cake tin?

3

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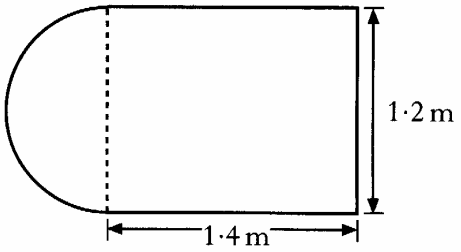
11. (*a*) The base of a lift is in the shape of a rectangle with a semi-circular end as shown.

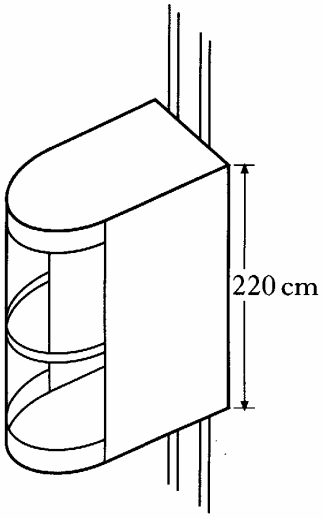


Calculate the area of the base of the lift.

3

(*b*) The lift is in the shape of a prism and is 220 centimetres high.

Find the volume of the lift.



2

[Turn over for Question 12 on *Page fourteen*

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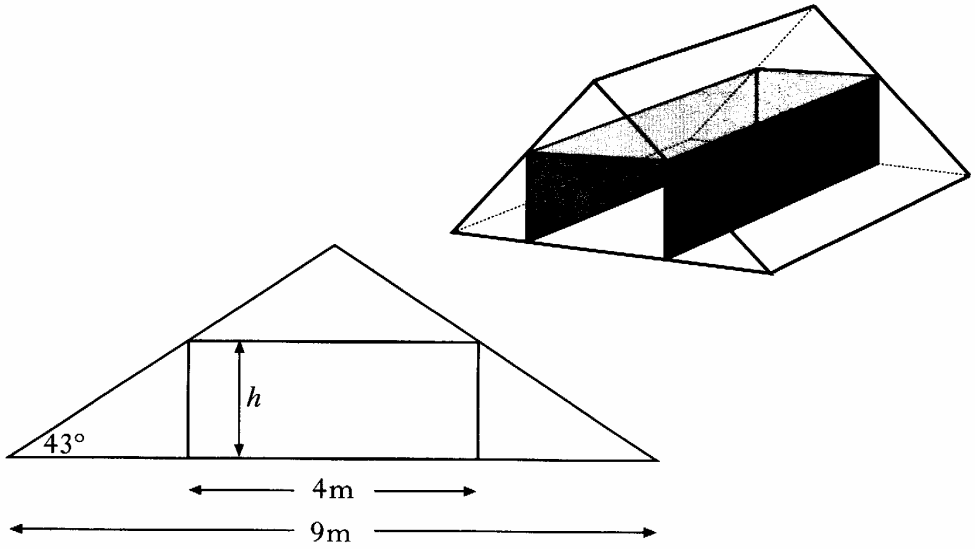
Marks	KU	RE

12. An architect is designing a room in an attic of a house.



- The room is 4 metres wide.
- The width of the roof is 9 metres.
- The sloping part of the roof makes an angle of 43° with the attic floor.

To satisfy building regulations the height, h, of the room must be **not less than** 2·3 metres.

Does the architect's design satisfy the building regulations?

Give a reason for your answer.

4

[END OF QUESTION PAPER]