

FOR OFFICIAL USE

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2500/403

NATIONAL
QUALIFICATIONS
2010

WEDNESDAY, 5 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

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Scottish candidate number

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Number of seat

- You may not use a calculator.**
- Answer as many questions as you can.
- 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.
- Full credit will be given only where the solution contains appropriate working.
- Before leaving the examination room you must give this book to the Invigilator. If you do not, you may lose all the marks for this paper.



FORMULAE LIST

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

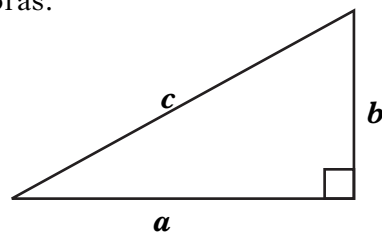
Area of a circle: $A = \pi r^2$

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

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

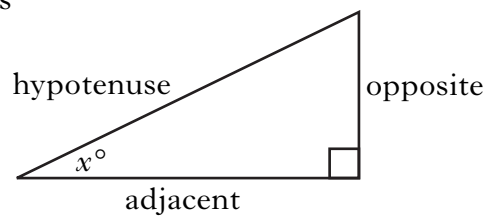
Volume of a triangular prism: $V = Ah$

Theorem of Pythagoras:



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

Trigonometric ratios
in a right angled
triangle:

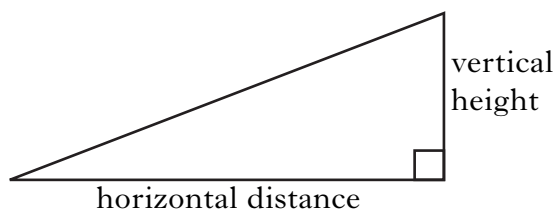


$$\tan x^\circ = \frac{\text{opposite}}{\text{adjacent}}$$

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

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

Gradient:



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

1. Carry out the following calculations.

(a) $9.32 - 5.6 + 4.27$

(b) 37.6×8

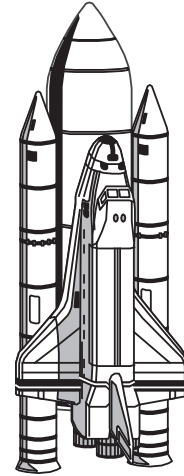
(c) $2680 \div 400$

(d) $7 \times 2\frac{1}{3}$

| <i>Marks</i> | KU | RE |
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2. The space shuttle programme costs \$5800 million.
Write this number in scientific notation.



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3. One day last February, Anna compared the temperature in Edinburgh with the temperature in Montreal.

The temperature in Edinburgh was 8°C .

The temperature in Montreal was -15°C .

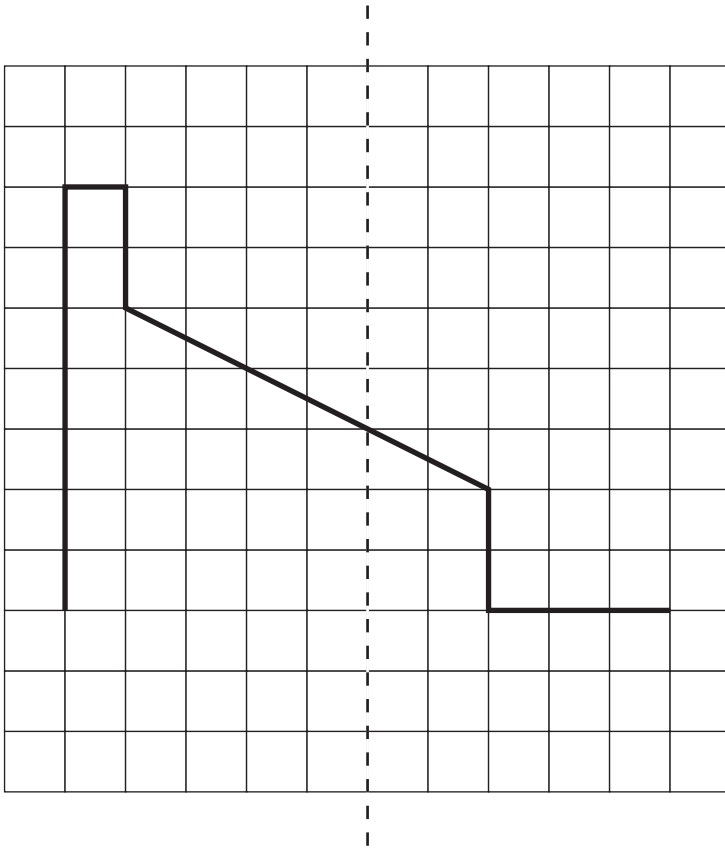
Find the difference between these temperatures.



Marks

KU RE

4. Complete this design so that the dotted line is an axis of symmetry.



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[Turn over

5. Karen asked her class to note the number of songs they downloaded to their phones in the last month.

The answers are shown below.

14 16 15 26 11 32 12 13 42 51
27 21 14 17 31 46 33 44 15 17

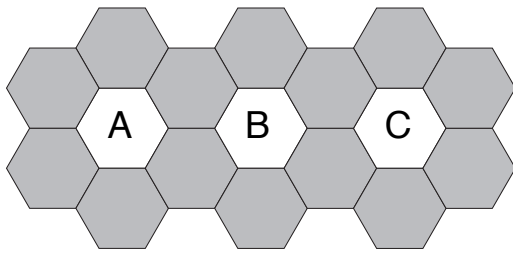
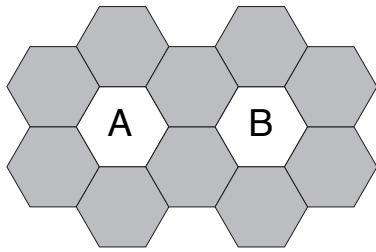
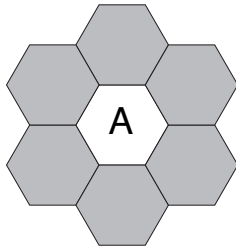


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6. Carla is laying a path in a nursery school.
She is using a mixture of alphabet tiles and coloured tiles.



- (a) Complete the table below.

| | | | | | | | |
|----------------------------------|---|----|---|---|---|--|----|
| Number of alphabet tiles (a) | 1 | 2 | 3 | 4 | 5 | | 12 |
| Number of coloured tiles (c) | 6 | 10 | | | | | |

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- (b) Write down a formula for calculating the number of coloured tiles (c) when you know the number of alphabet tiles (a).

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- (c) Carla uses 86 coloured tiles to make the path.
How many alphabet tiles will be in the path?

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7. When on holiday in Spain, Sandy sees a pair of jeans priced at 65 euros.
Sandy knows that he gets 13 euros for £10.
What is the price of the jeans in pounds?



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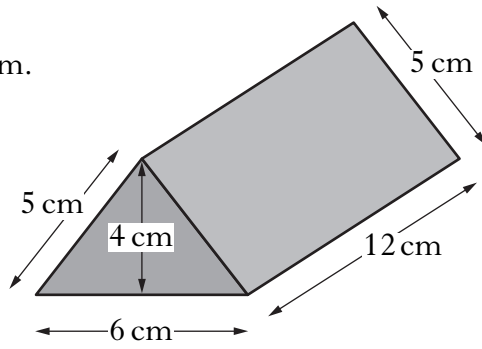
8. The price of a laptop is reduced from £400 to £320.
Calculate the percentage reduction in the price of the laptop.



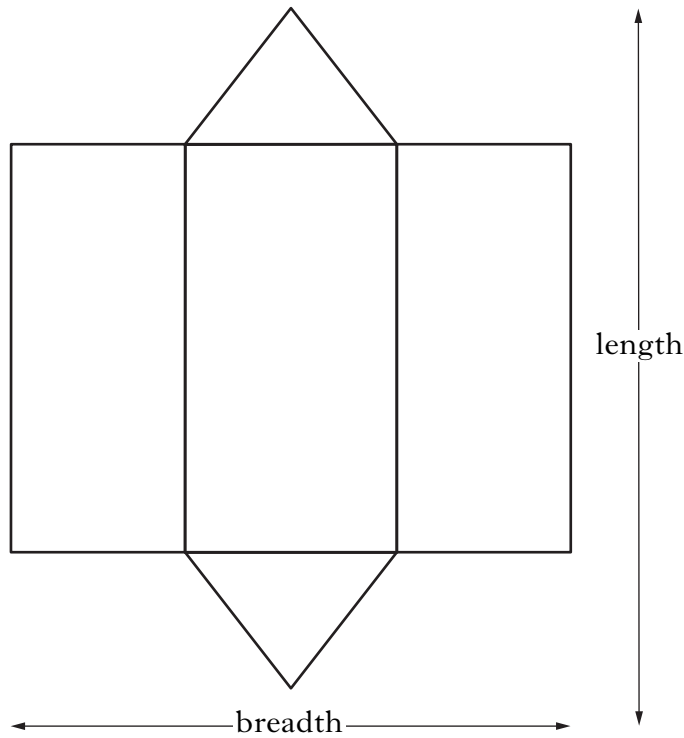
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9. The diagram shows a triangular prism.
The dimensions are given on the diagram.



A **net** of this triangular prism is shown below.

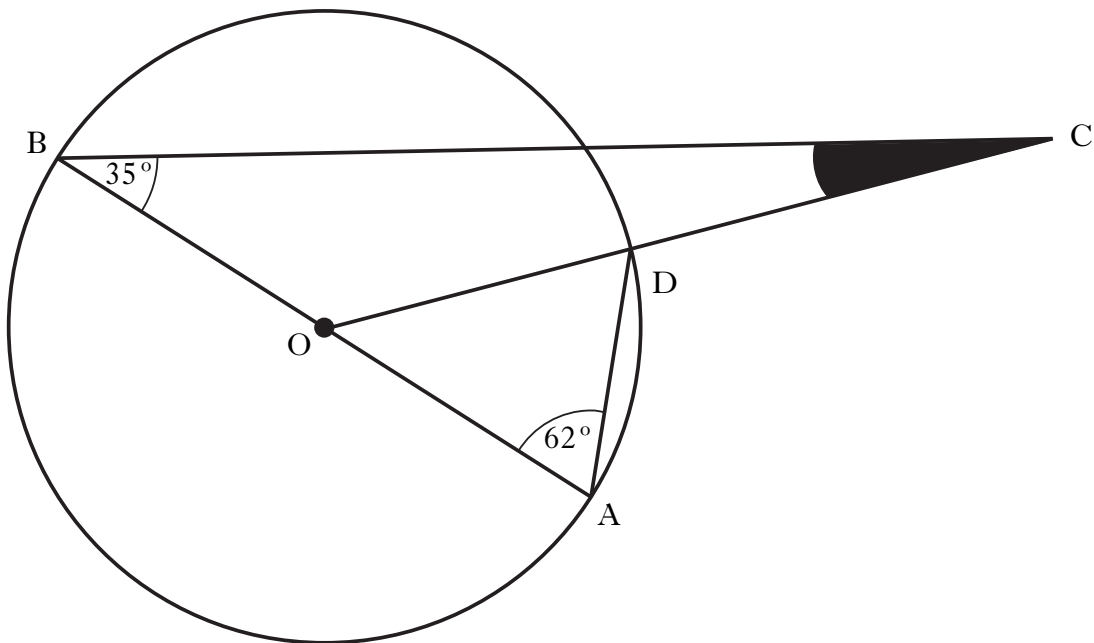


Calculate the length and breadth of this net.

Marks

KU RE

10.



In the diagram above:

- AB is a diameter of the circle with centre O
- OC intersects the circle at D
- Angle $ABC = 35^\circ$
- Angle $BAD = 62^\circ$

Calculate the size of the shaded angle.

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[END OF QUESTION PAPER]

ADDITIONAL SPACE FOR ANSWERS

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NATIONAL
QUALIFICATIONS
2010

WEDNESDAY, 5 MAY
11.35 AM – 12.30 PM

MATHEMATICS
STANDARD GRADE
General Level
Paper 2

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Surname

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Scottish candidate number

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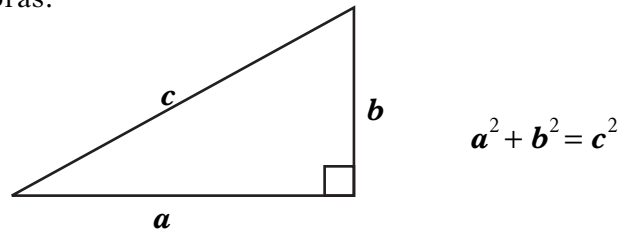
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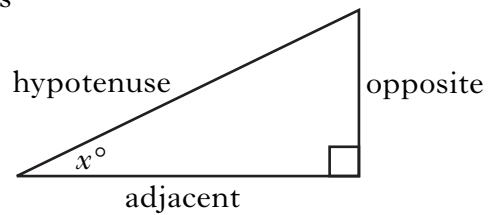
FORMULAE LIST

| | |
|------------------------------------|-----------------|
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| Area of a circle: | $A = \pi r^2$ |
| Curved surface area of a cylinder: | $A = 2\pi r h$ |
| Volume of a cylinder: | $V = \pi r^2 h$ |
| Volume of a triangular prism: | $V = Ah$ |

Theorem of Pythagoras:

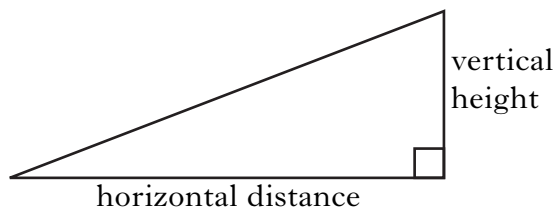


Trigonometric ratios
in a right angled
triangle:



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

Gradient:



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

1. Ten people were asked to guess the number of coffee beans in a jar.

Their guesses were:

310 260 198 250 275 300 245 225 310 200

(a) What is the range of this data?



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(b) Find the median.

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2. Mr and Mrs Kapela book a cruise to Bruges for themselves and their three children.



- They depart on 27 June
- Mr and Mrs Kapela share an outside cabin and their three children share an inside cabin
- There is a 20% discount for each child

Calculate the total cost of the cruise.

| Mini Cruise to Bruges, Belgium | | |
|--------------------------------|------------------|-------------------|
| | Price per person | |
| Departure Date | Inside Cabin (£) | Outside Cabin (£) |
| 16 May | 236 | 250 |
| 30 May | 244 | 274 |
| 13 June | 266 | 300 |
| 27 June | 275 | 310 |
| 12 July | 291 | 325 |
| 26 July | 312 | 355 |
| 9 Aug | 327 | 370 |

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3. As part of his healthy diet, Tomas has decided to buy fruit in his weekly shopping.

His favourite fruits and their costs per pack are given in the table below.

| <i>Fruit</i> | <i>Cost</i> |
|--------------|-------------|
| Apples | £1.25 |
| Oranges | £1.20 |
| Grapes | £2.49 |
| Pears | £1.56 |
| Melon | £1.98 |



He wants to

- buy 3 different packs of fruit
- spend a maximum of £5 on fruit.

One possible selection and its cost are shown in the table below.

Complete the table to show all of Tomas's possible selections and their cost.

| Apples | Oranges | Grapes | Pears | Melon | Cost |
|--------|---------|--------|-------|-------|-------|
| ✓ | ✓ | | ✓ | | £4.01 |
| | | | | | |
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5. For safety reasons the speed limit outside Fairfield Park is 20 miles per hour.

The distance between the speed limit signs outside Fairfield Park is half a mile.

A van took 2 minutes to travel between these signs.

Was the van travelling at a safe speed?

Give a reason for your answer.



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6. (a) Simplify

$$8(c - 3) + 5(c + 2).$$

3

(b) Solve algebraically

$$25 = 7x + 4.$$

2

7. Rowan wants to buy 13 theatre tickets.
The price of one ticket is £12.50.
The theatre has a special online offer of four tickets for the price of three.
Rowan makes use of the special online offer.
How much does Rowan pay for the 13 theatre tickets?



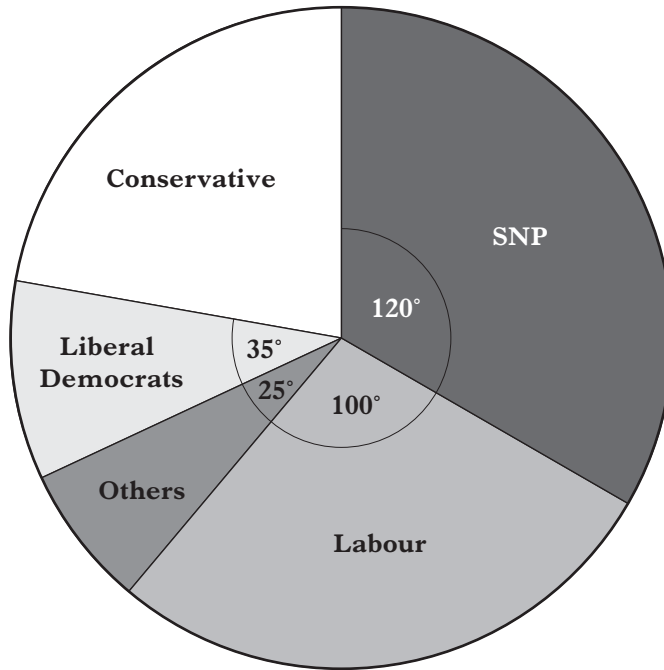
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8. A survey of 1800 first time voters was carried out.
The pie chart below shows how they would vote at the next election.



How many of the 1800 first time voters would vote Conservative?

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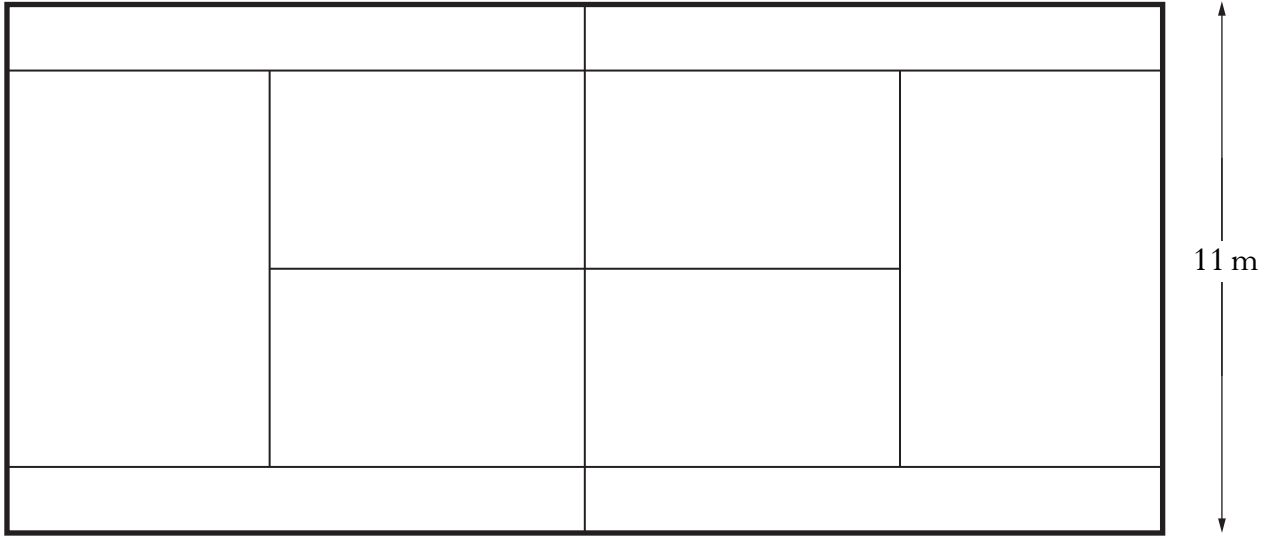
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9. A tennis court is 11 metres wide.
It has an area of 264 square metres.

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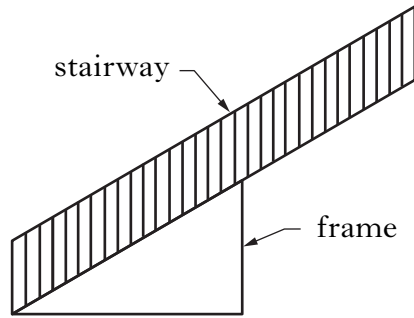
Calculate the perimeter of the tennis court.

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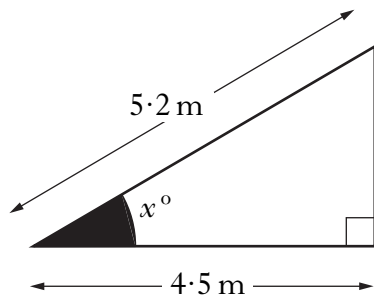
Marks

10. Ahmed is making a frame to strengthen a stairway in a shopping centre.



He needs to know the angle the stairway makes with the floor, as shown in the diagram below.

The hypotenuse of the frame is 5.2 m and the horizontal distance is 4.5 m.



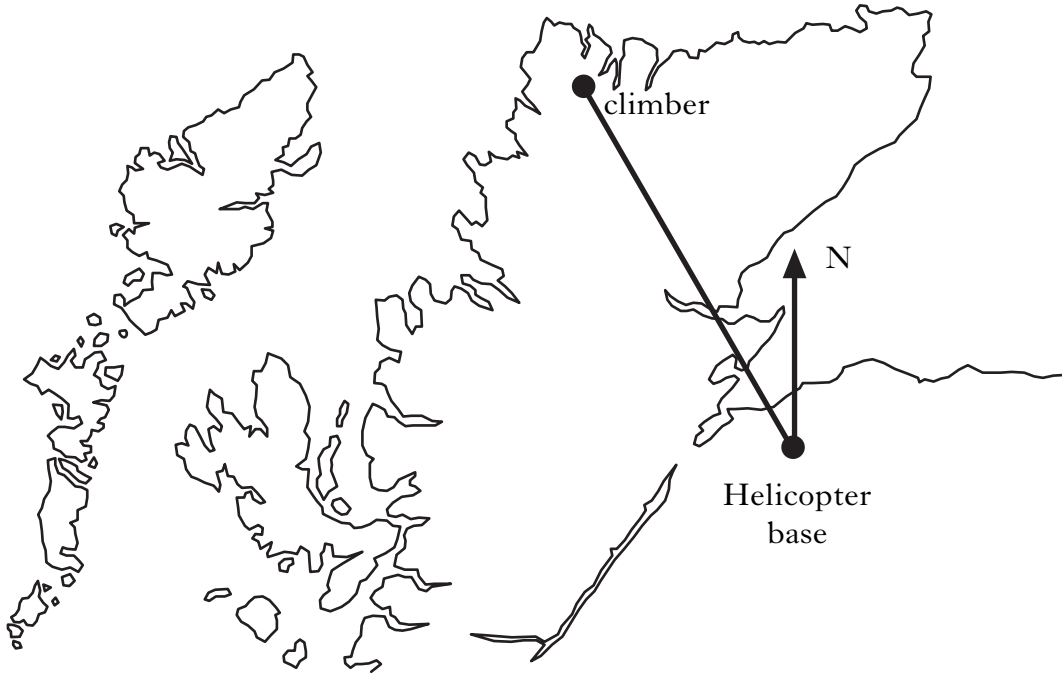
Calculate the size of the shaded angle x° .

| Marks | |
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11. A climber needs to be rescued.

His position from the helicopter base is marked on the map.



(a) Using a scale of 1 centimetre to 15 kilometres, calculate the distance of the climber from the helicopter base.

(b) Find the bearing of the climber from the helicopter base.

1

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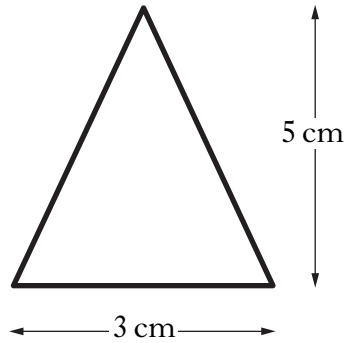
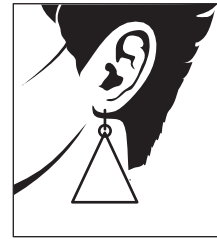
[Turn over

Marks

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12. An earring in the shape of an isosceles triangle is made from silver wire.

The dimensions of the earring are shown on the diagram below.



Calculate the length of silver wire needed to make a **pair** of earrings.

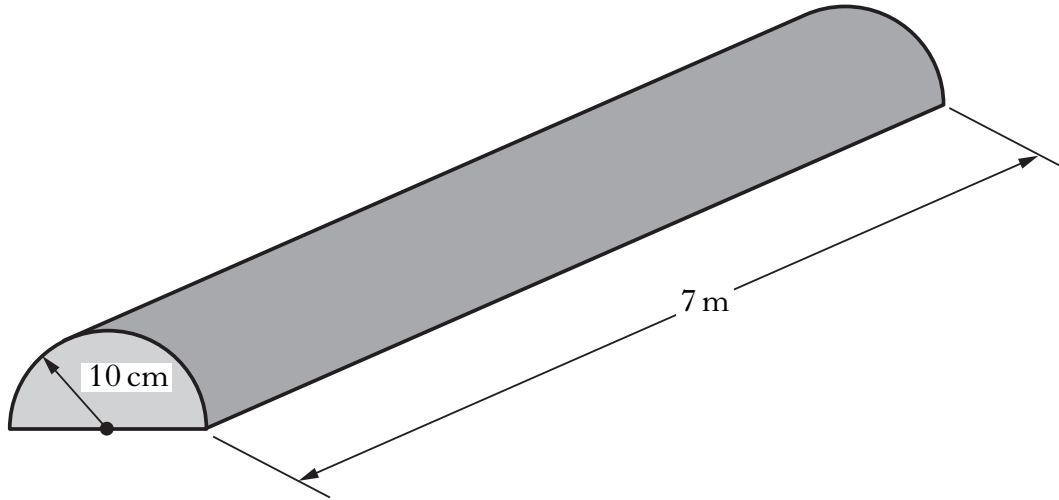
Do not use a scale drawing.

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13. A plastic speed bump in the shape of a half cylinder is used to slow traffic outside a Primary School.

The speed bump has radius of 10 centimetres and a length of 7 metres as shown in the diagram below.



Calculate the volume of plastic used to make the speed bump.

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[Turn over for Question 14 on Page sixteen

Marks

| KU | RE |
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14. Liam buys a new stereo using the monthly payment plan.

The cash price of the stereo is £360.

The total cost of the monthly payment plan is **5% more than the cash price**.

Liam pays a deposit of one fifth of the cash price followed by 30 equal monthly payments.

Cash Price £360



Monthly Payment Plan
Deposit $\frac{1}{5}$ of cash price
and 30 monthly payments

How much will Liam pay each month?

[END OF QUESTION PAPER]

ADDITIONAL SPACE FOR ANSWERS

ADDITIONAL SPACE FOR ANSWERS

ADDITIONAL SPACE FOR ANSWERS

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