

FOR OFFICIAL USE

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**X100/103**



Total  
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NATIONAL  
QUALIFICATIONS  
2008

TUESDAY, 20 MAY  
1.55 PM – 2.50 PM

**MATHEMATICS**  
**INTERMEDIATE 1**  
Units 1, 2 and 3  
Paper 2

**Fill in these boxes and read what is printed below.**

Full name of centre

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Town

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Forename(s)

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Surname

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Date of birth

Day            Month            Year

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Scottish candidate number

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Number of seat

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- 1 You may use a calculator.**
- 2 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.
- 3 Full credit will be given only where the solution contains appropriate working.
- 4 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.

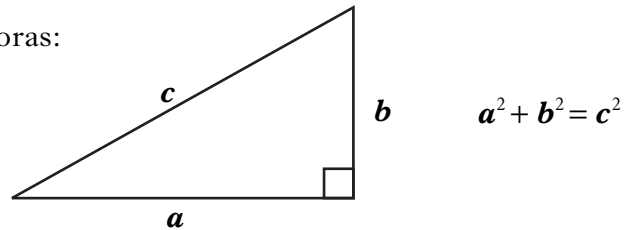
Use blue or black ink. Pencil may be used for graphs and diagrams only.



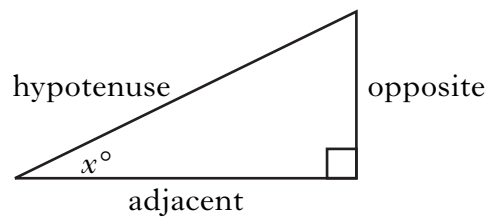
## FORMULAE LIST

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

Theorem of Pythagoras:



Trigonometric ratios  
in a right angled  
triangle:



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

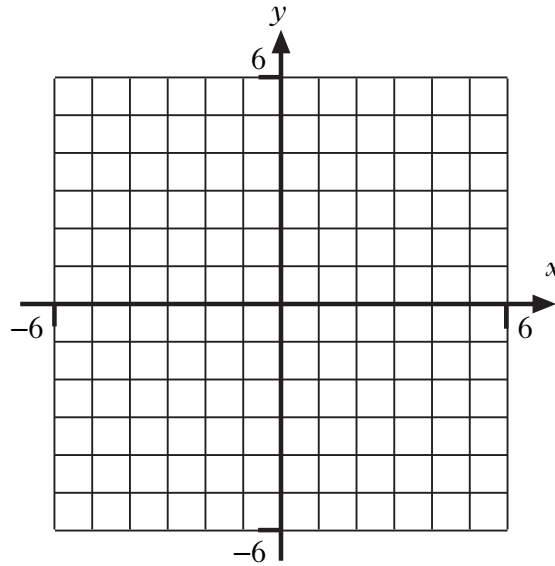
$$\sin x^\circ = \frac{\text{opposite}}{\text{hypotenuse}}$$

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

**ALL questions should be attempted.**

Marks

1. (a) On the grid below plot the points  $A(-2,4)$ ,  $B(-4,-1)$  and  $C(1,-3)$ .



- (b) Plot the point D so that shape ABCD is a square.

2

1

**[Turn over**

Marks

2. The table below shows the basic annual premiums charged for car insurance by an insurance company.

The basic premium depends on the area where the driver lives and the group their car belongs to.

BASIC ANNUAL PREMIUM					
AREA	CAR GROUP				
	1	2	3	4	5
<b>A</b>	£428	£517	£613	£725	£838
<b>B</b>	£497	£555	£659	£779	£898
<b>C</b>	£525	£598	£712	£841	£975
<b>D</b>	£540	£651	£775	£915	£1055

- (a) Lynn's car is in group 4 and she lives in area C.

Write down her basic annual premium.

1

Drivers who do not make a claim on their insurance receive a discount on their basic annual premium as shown in the table below.

Number of years without a claim	1	2	3	4 or more
Discount	30%	40%	55%	67%

- (b) Lynn has not made a claim for 4 years.

How much will it cost her to insure her car?

2

3. (a) Multiply out the brackets and simplify

$$4(5u - 2) + 15.$$

Marks

2

(b) Factorise

$$9c + 24.$$

2

[Turn over

Marks

4. A grass lawn is treated with weedkiller.  
The lawn is split into twenty squares each of the same area.  
Ten of the squares are treated with Weedclear.  
Three weeks later the number of weeds in each of these squares is as follows:

3, 4, 6, 2, 1, 7, 2, 1, 1, 3.

(a) Find the median.

2

(b) Find the range.

1

The other ten squares are treated with Noweed.  
For these squares the median is 2 and the range is 10.

(c) Make **two** comments comparing the number of weeds in squares treated with Weedclear and Noweed.

2

*Marks*

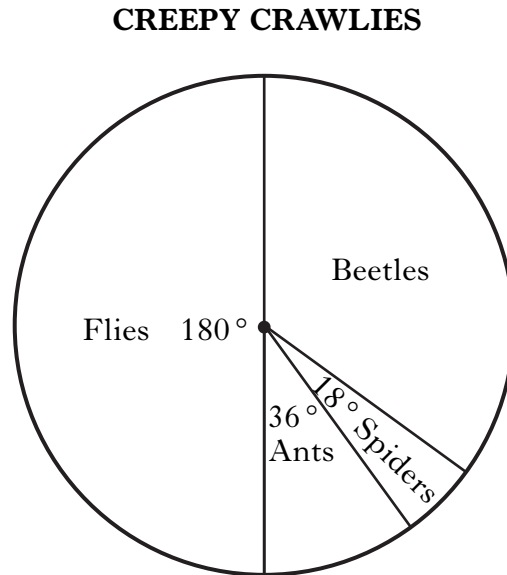
5. Ross drove 190 miles from Preston to Edinburgh in 3 hours 30 minutes.  
During the first part of his journey he drove for 2 hours at an average speed of 68 miles per hour.  
Find the average speed in miles per hour for the rest of his journey.

4

**[Turn over**

Marks

6. Some biology students were doing a project on “creepy crawlies”. The pie chart shows the different types of creepy crawlies that the students collected from a garden.

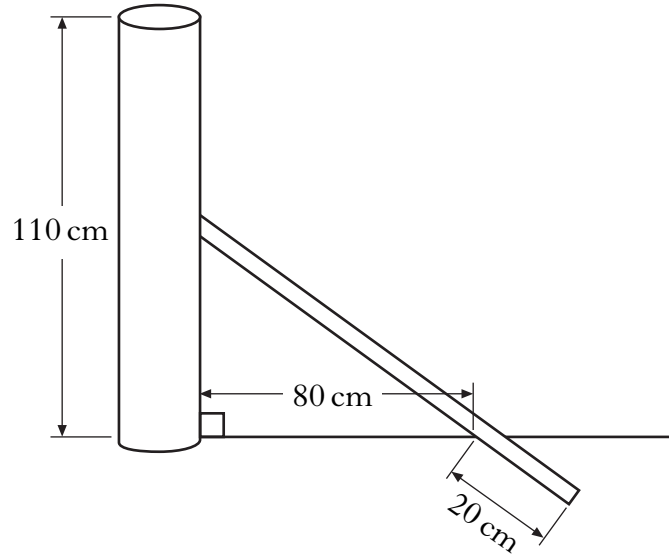


The students collected 220 creepy crawlies altogether.  
How many of them were beetles?

3

Marks

7. A farmer is building a wire fence around a field.  
The fence has heavy posts at the corners.  
Each corner post is supported by a stake as shown in the diagram.



- The corner post is 110 centimetres high.
- The stake meets the corner post halfway up.
- The stake meets the ground 80 centimetres from the foot of the corner post.
- 20 centimetres of the stake is below ground level.

Calculate the length of the stake.

**Do not use a scale drawing.**

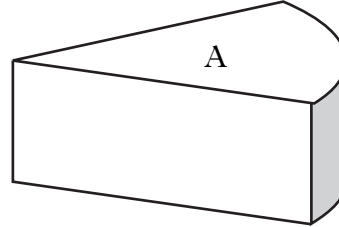
4

[Turn over

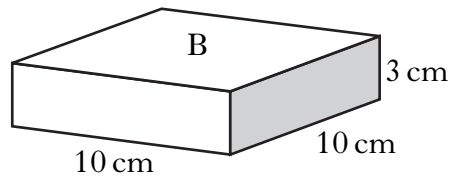
Marks

8. Shown below are two pieces of cheese.  
The weight of each piece is proportional to its volume.

Piece A has a volume of 400 cubic centimetres.  
It weighs 480 grams.



Piece B is a cuboid.



Find the weight of piece B.

4

Marks

9. The table shows the ticket prices for a theme park in France.  
The prices are given in euros.

<b>Ticket</b>	<b>Adult price</b>	<b>Child price</b>
Bronze (valid 1 day)	€50	€40
Silver (valid 2 days)	€90	€75
Gold (valid 3 days)	€110	€85

Gavin buys silver tickets for two adults and one child.

Find the total cost, in pounds and pence, of buying these tickets if the exchange rate is  $\pounds 1 = 1.39$  euros.

3

[Turn over

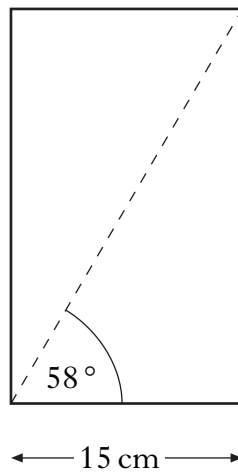
Marks

10. Solve algebraically the inequality

$$\frac{1}{2}y + 3 > 13.$$

2

11. Calculate the area of the rectangle shown below.  
**Do not use a scale drawing.**



4

*Marks*

12. Use the formula below to find the value of  $T$  when  $r = 2.6$  and  $s = 1.4$ .

$$T = \frac{rs}{r+s}$$

3

**[Turn over**

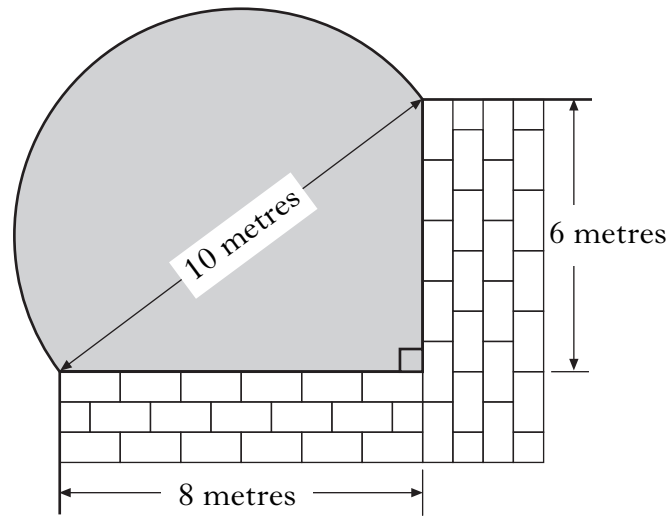
*Marks*

13. Sergei has been training to run a marathon.  
Since he started training his weight has dropped from 80 kilograms to 74 kilograms.  
Express his weight loss as a percentage of his original weight.

4

Marks

14. The diagram below shows part of a garden which is being watered from a sprinkler.



The area being watered is in the shape of a semi-circle and a right angled triangle.

Calculate the area being watered.

4

[END OF QUESTION PAPER]

**ADDITIONAL SPACE FOR ANSWERS**