

FOR OFFICIAL USE

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Total  
mark

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**X100/101**

NATIONAL  
QUALIFICATIONS  
2005

FRIDAY, 20 MAY  
1.00 PM – 1.35 PM

MATHEMATICS  
INTERMEDIATE 1  
Units 1, 2 and 3  
Paper 1  
(Non-calculator)

Fill in these boxes and read what is printed below.

Full name of centre

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Town

--

Forename(s)

--

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 **NOT** 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.



## FORMULAE LIST

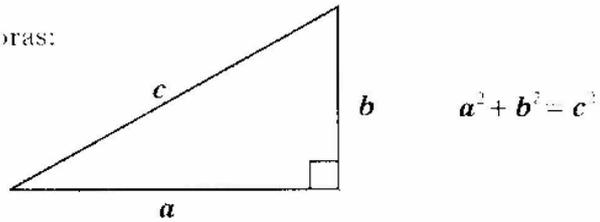
Circumference of a circle:

$$C = \pi d$$

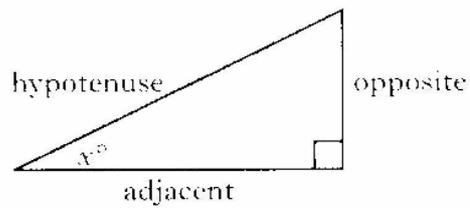
Area of a circle:

$$A = \pi r^2$$

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) Find  $6 \cdot 17 - 2 \cdot 3$ .

1

(b) Find 75% of £1200.

1

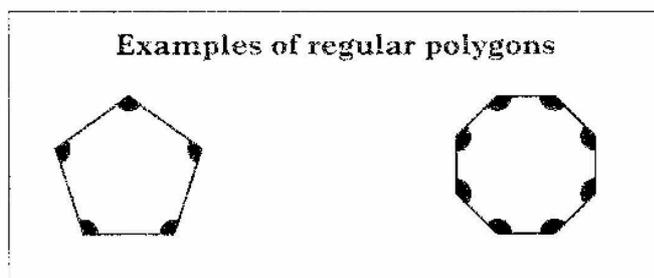
2. Joyce is going on holiday. She must be at the airport by 1.20 pm. It takes her 4 hours 30 minutes to travel from home to the airport. What is the latest time that she should leave home for the airport?

1

[Turn over

Marks

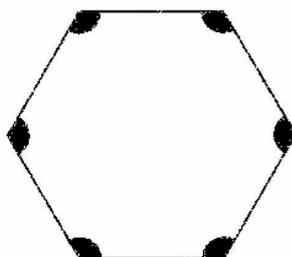
3. A regular polygon is a shape with three or more equal sides.



A rule used to calculate the size, in degrees, of each angle in a regular polygon is:

$$\text{Size of each angle} = 180 - (360 \div \text{number of sides})$$

**Calculate** the size of each angle in the regular polygon below.



**Do not measure with a protractor.**

**You must show your working.**

2

1. The number of pages received in each of 100 pages  
is shown in the frequency table.



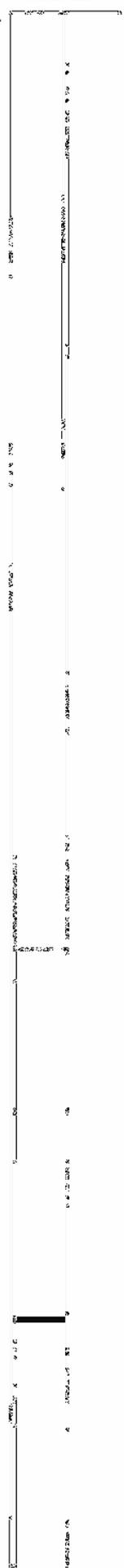
Number of pages	Frequency	Number of pages	Frequency
10	10	20	10
20	20	30	10
30	30	40	10
40	40	50	10
50	50	60	10
Total = 100		Total = 100	

Therefore the table shows that out of 100 pages received in a year,

2. The number of pages received in each of 100 pages

$$100 - 10 = 90$$

100 pages



Marks

6. Anwar wants to buy some accessories for his computer.  
He sees this advert for Cathy's Computers.

### Cathy's Computers

Digital Camera  
**£95**



Scanner  
**£75**



Printer  
**£70**



Cordless Keyboard  
**£45**



Pair of Speakers  
**£40**



**Special Offer**

Free microphone  
when you spend  
£160 or more



Anwar wants to spend enough to get the free microphone.  
He can afford to spend a maximum of £200.  
He does not want to buy more than one of each accessory.

One combination of accessories that Anwar can buy is shown in the table below.

Digital Camera £95	Scanner £75	Printer £70	Cordless Keyboard £45	Pair of Speakers £40	Total Value
	✓	✓		✓	£185

Complete the table to show all possible combinations that Anwar can buy.

3

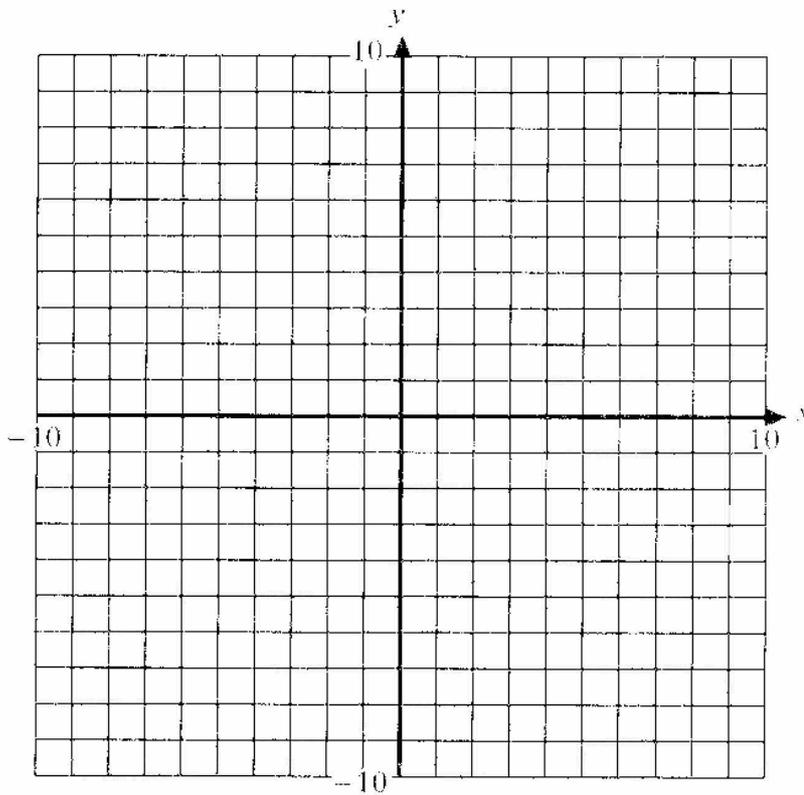
Marks

7. (a) Complete the table below for  $y = -2x + 5$ .

$x$	-2	0	4
$y$			

2

(b) Draw the line  $y = -2x + 5$  on the grid.



2

[Turn over

Marks

8. (a) While in New York, Martin changed £50 into US dollars.  
The exchange rate was £1 = \$1.62.  
How many US dollars did Martin receive for £50?

2

- (b) A few days later he received \$320 in exchange for £200.  
What was the new exchange rate?

2

9. (a) Write  $\frac{7}{1000}$  as a decimal.

1

- (b) Starting with the smallest, write the following numbers in order.

$\frac{7}{1000}$ ,      0.069,       $7.1 \times 10^{-4}$

**Show working to explain your answer.**

3

Marks

10. In a **magic square**, the numbers in each row, each column and each diagonal add up to the same **magic total**.

In this magic square the **magic total** is 3.

-2	5	0
3	1	-1
2	-3	4

(a)

-4	3	-2
1	-1	-3
0	-5	2

This is another magic square.  
What is its **magic total**?

1

- (b) Complete this **magic square**.

1		
	-2	
-3		-5

3

[END OF QUESTION PAPER]

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Total mark

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**X100/103**

NATIONAL  
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2005

FRIDAY, 20 MAY  
1.55 PM – 2.50 PM

MATHEMATICS  
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Units 1, 2 and 3  
Paper 2

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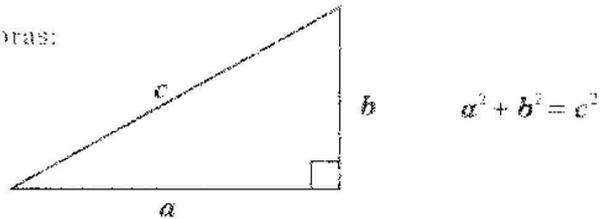


## FORMULAE LIST

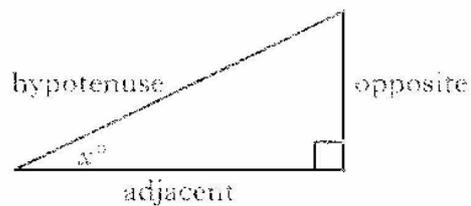
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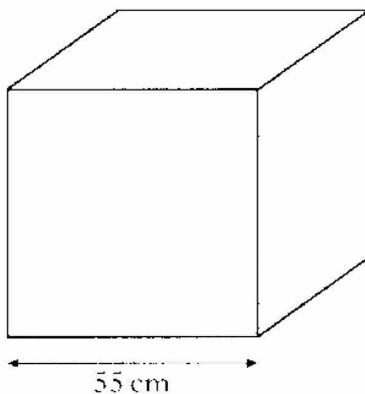
$$\sin x^\circ = \frac{\text{opposite}}{\text{hypotenuse}}$$

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

Marks

**ALL questions should be attempted.**

1. Calculate the volume of the cube below.



Round your answer to the nearest thousand cubic centimetres.

2

2. Claire sells cars.

She is paid £250 per month plus 3% commission on her sales.

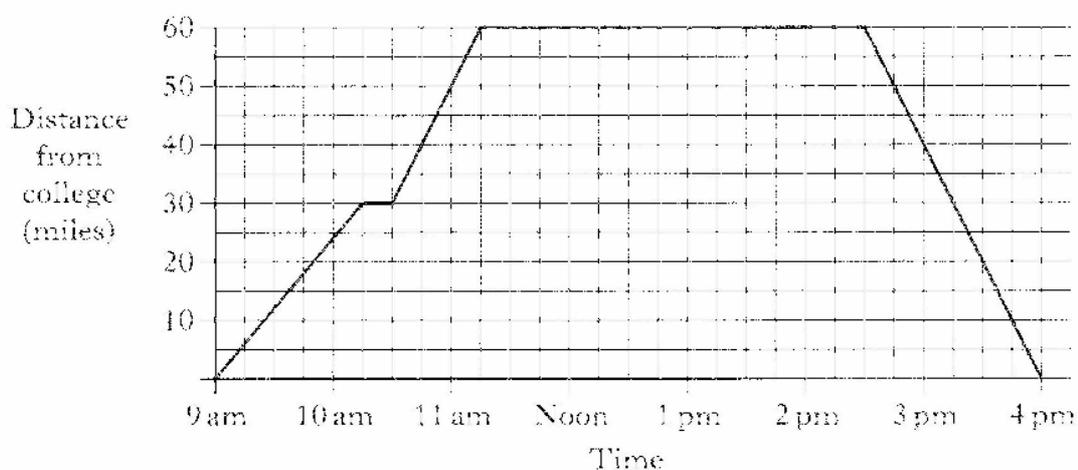
How much is she paid in a month when her sales are worth £72 000?

2

**[Turn over**

Marks

3. A group of students visit a theme park.  
The graph below shows their journey.  
They set off from the college at 9 am and arrive back at 4 pm.



- (a) How long did the students spend at the theme park?
- (b) Calculate the average speed, in miles per hour, of the students' return journey.

1

3

4. Solve algebraically the inequality

$$3t + 4 > 28.$$

2

Marks

5. The stem and leaf diagram below shows the ages of the players in the Kestrels rugby team.

**AGES**  
**Kestrels**

1	9
2	1 3 4 7 9
3	0 2 4 5 5 5 8 9
4	1

2 | 1 represents 21 years

- (a) What age is the oldest player?

1

- (b) Calculate the range of ages.

2

The stem and leaf diagram below shows the ages of both the Kestrels and the Falcons rugby teams.

**AGES**

<b>Falcons</b>		<b>Kestrels</b>
	9 9	1   9
8 7 7 6 3 2 1 1 0	2	2   1 3 4 7 9
8 6 4 3	3	3   0 2 4 5 5 5 8 9
	4	4   1

2 | 1 represents 21 years

- (c) Compare the ages of the two teams. Comment on any difference.

1

[Turn over

Marks

6. (a) Multiply out the brackets and simplify

$$11n + 4(7 - 2n).$$

2

- (b) Factorise  $15 + 6x.$

2

7. The scores of 12 golfers in a competition were as follows.

67	70	68	75	71	70
70	75	76	75	74	75

- (a) Find the modal score.

1

- (b) Find the median score.

2

- (c) Find the probability of choosing a golfer from this group with a score of 70.

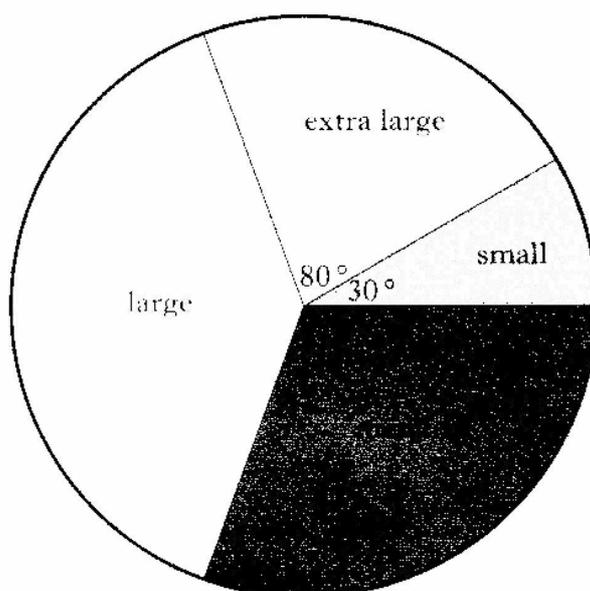
1

Marks

8. 60 workers in a factory voted on a new pay deal.  
42 of them voted to accept the deal.  
What percentage voted to accept the deal?

3

9. The pie chart shows the different sizes of eggs laid by a flock of hens.



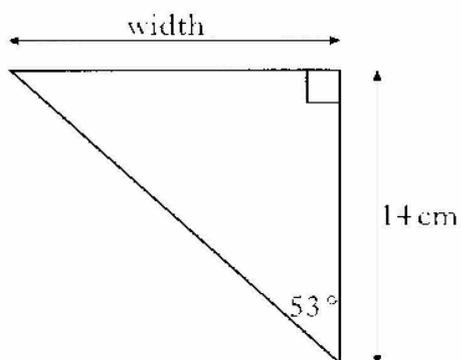
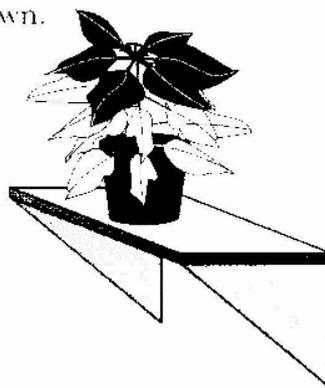
The flock of hens laid 1260 eggs.  
How many of the eggs were large?

3

[Turn over

Marks

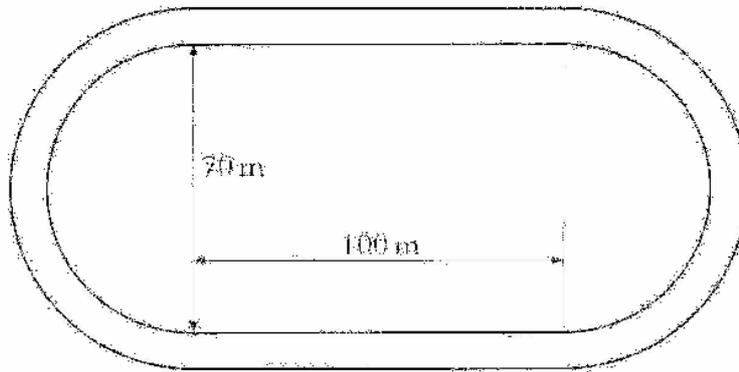
10. A rectangular shelf is supported by brackets as shown.  
Each bracket is a right angled triangle.



Calculate the width of this bracket.  
Give your answer correct to one decimal place.  
**Do not use a scale drawing.**

4

11. The diagram below shows a speedway track.



The straights are each 100 metres long.  
The bends are semi-circles as shown.  
Calculate the perimeter of the inside of the track.

4

12. Use the formula below to find the value of  $A$  when  $b = 2.4$  and  $c = 5$ .

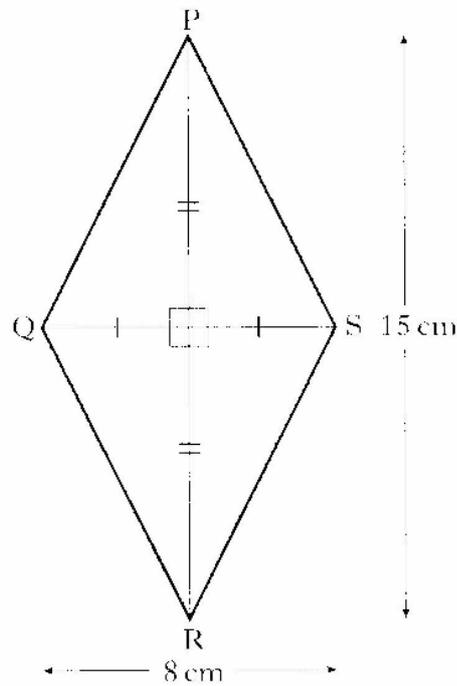
$$A = 3bc^2$$

3

[Turn over

Marks

13. PQRS is a rhombus.  
The diagonals PR and QS are 15 centimetres and 8 centimetres long as shown.



Calculate the length of side PQ.  
**Do not use a scale drawing.**

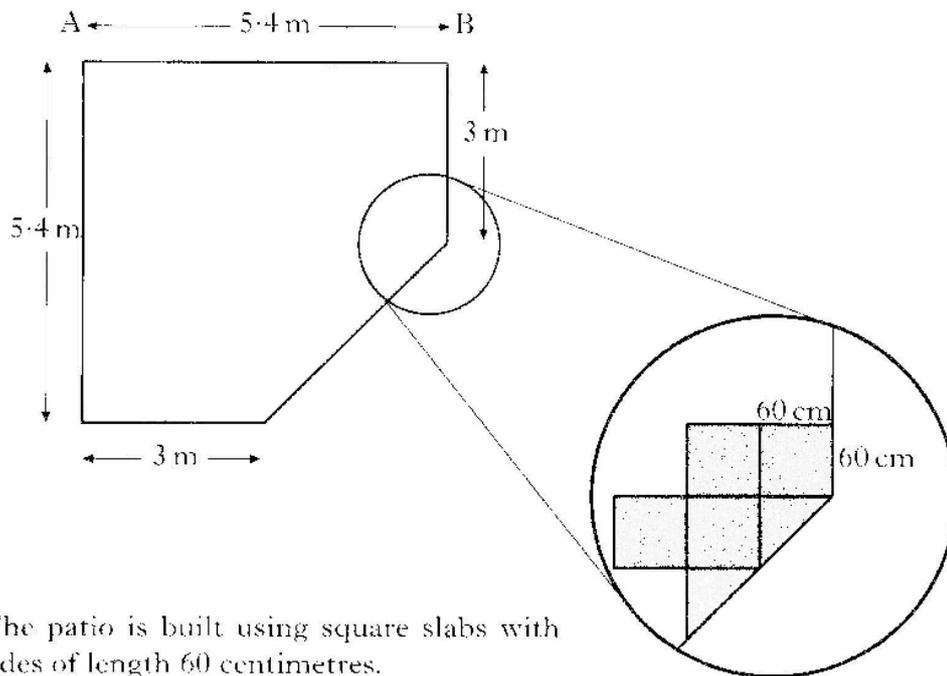
3

14. Margaret is recovering from an operation.  
She needs to take 4 tablets each day for a year.  
The tablets are supplied in boxes of 200.  
Each box costs £6.50.  
How much does it cost for the year's supply?

3

Marks

15. The diagram below shows a plan of a patio.



The patio is built using square slabs with sides of length 60 centimetres.

The slabs can be cut in half to fit as shown.

- (a) How many slabs fit exactly along edge  $AB$ ?

1

- (b) How many slabs are needed altogether to build the patio?

4

[END OF QUESTION PAPER]