

FOR OFFICIAL USE

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Total
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X100/101

NATIONAL
QUALIFICATIONS
2003

WEDNESDAY, 21 MAY
1.30 PM – 2.05 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

--

Town

--

Forename(s)

--

Surname

--

Date of birth

Day Month Year

--	--	--	--	--	--	--	--

Scottish candidate number

--	--	--	--	--	--	--	--	--	--

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.**
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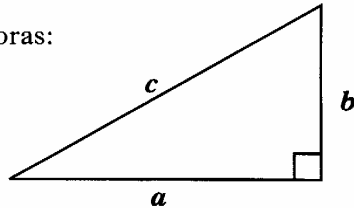


FORMULAE LIST

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

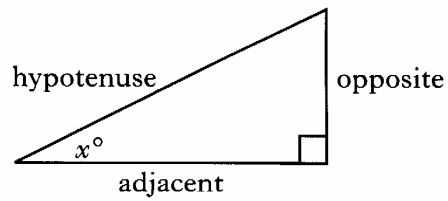
Area of a circle: $A = \pi r^2$

Theorem of Pythagoras:



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

Trigonometric ratios
in a right angled
triangle:



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

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

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

ALL questions should be attempted.

Marks

1. (a) Find $6 \cdot 23 - 3 \cdot 7$.

1

(b) Find 5% of £140.

1

(c) Find $-40 + 15$.

1

2. A rule used to calculate the cost in pounds of electricity is:

$$\text{Cost} = 19 + (\text{number of units used} \times 0 \cdot 07)$$

Find the cost of 600 units of electricity.

2

[Turn over

Marks

3. (a) An inter-city coach left Aberdeen at 10.40 am and reached Inverness at 1.25 pm.
How long did the journey take?

1

- (b) The average speed of the coach during the journey was 40 miles per hour.
Find the distance between Aberdeen and Inverness.

3

4. Solve algebraically the equation

$$8c + 3 = 31 + c.$$

3

Marks

5. Andy wants to make 150 copies of a music booklet.
8 sheets of paper are required for each booklet.

(a) Find the total number of sheets required.

1

Paper is sold in packets which contain 500 sheets.

(b) How many packets of paper will Andy need to buy?

2

6. Solve algebraically the inequality

$$9m - 2 > 70.$$

2

[Turn over

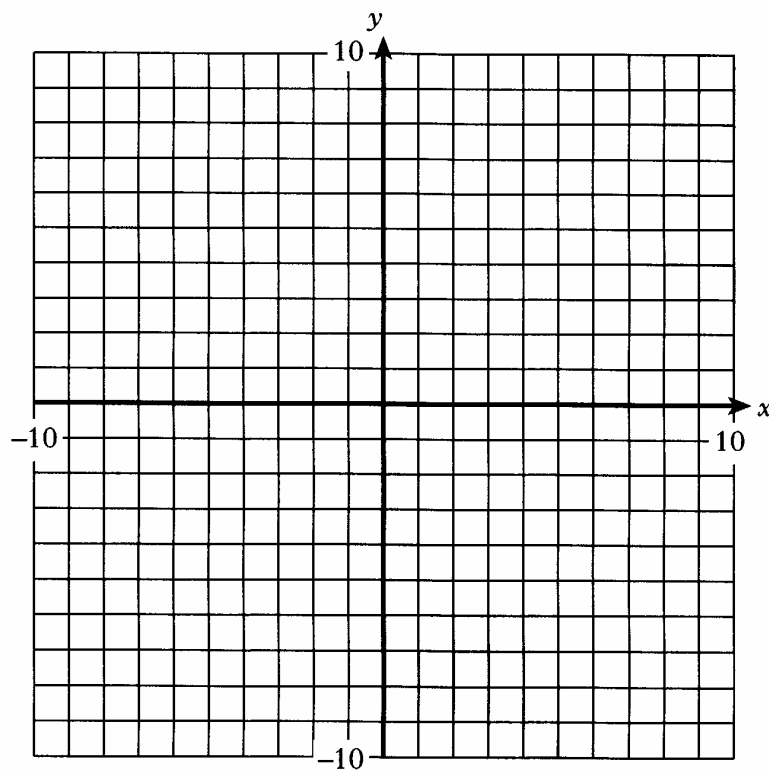
Marks

7. (a) Complete the table below for $y = 1.5x - 1$.

x	-2	0	6
y			

2

(b) Draw the line $y = 1.5x - 1$ on the grid.



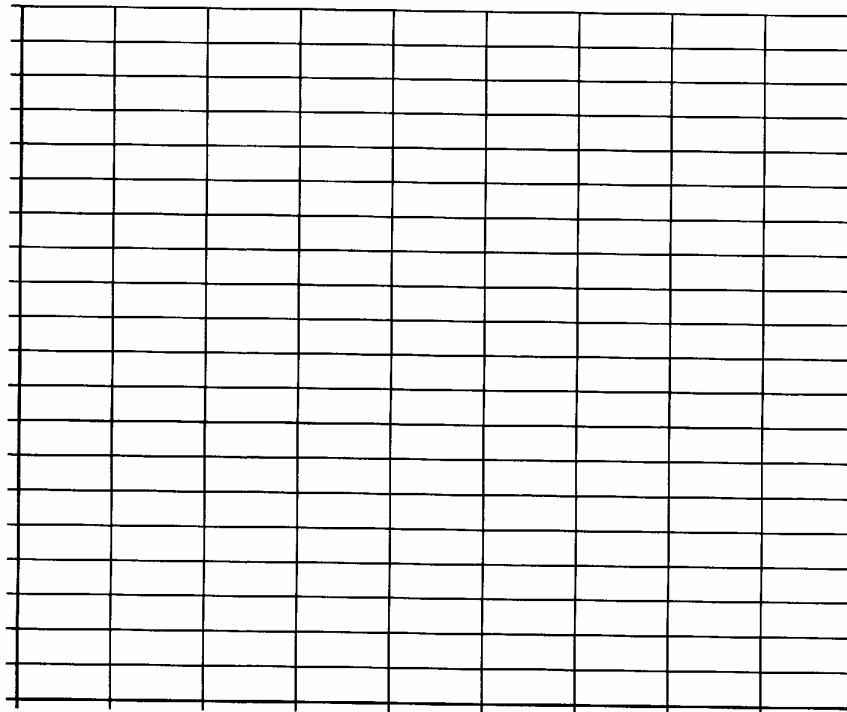
2

Marks

8. In a local election the number of votes for each of the four candidates is shown in the table below.

<i>Candidate</i>	<i>Votes</i>
Smith	380
Patel	240
Green	100
Jones	170

On the grid below, draw a bar graph to show this information.



4

9. Five staff work in an office.
Three of them are female.
What percentage of the staff is female?

3

Marks

10. This is a multiplication square.

8	×	5	=	40
×		×		×
10	×	-2	=	-20
=		=		=
80	×	-10	=	-800

(a) Complete this multiplication square.

3	×	-7	=	
×		×		×
-1	×	5	=	
=		=		=
	×		=	

2

10. (continued)

(b) Complete this multiplication square.

-5	×		=	
×		×		×
	×		=	-12
=		=		=
	×	-8	=	-120

Marks

3

[END OF QUESTION PAPER]

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Total
mark

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X100/103

NATIONAL
QUALIFICATIONS
2003

WEDNESDAY, 21 MAY
2.25 PM – 3.20 PM

MATHEMATICS
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Units 1, 2 and 3
Paper 2

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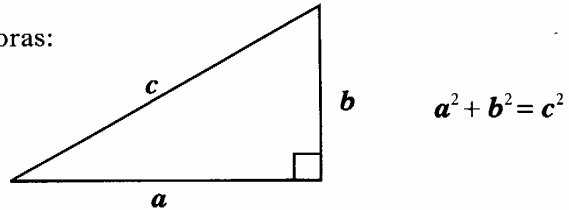


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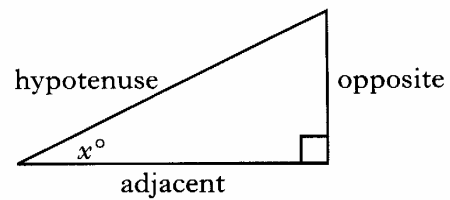
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Marks

ALL questions should be attempted.

1. A day in December is chosen at random for a youth club outing.
Find the probability that a **Saturday** is chosen.

DECEMBER

Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

2. A common cold virus is 5×10^{-4} millimetres long.
Write this number in full.

1

2

[Turn over

Marks

3. (a) Multiply out the brackets and simplify

$$5(a + 2b) - 3b.$$

2

(b) Factorise $6n + 30.$

2

Marks

4. The income of each employee in a company is shown in this frequency table.

<i>Income</i> £	<i>Frequency</i>	<i>Income × Frequency</i>
10 000	2	
12 000	3	
14 000	5	
16 000	8	
18 000	7	
	Total = 25	Total =

- (a) Write down the modal income.

1

- (b) Complete the table above and find the mean income.

3

[Turn over

Marks

5. A room in the Hotel Royale in Paris costs 130 euros per night.
The exchange rate is 1.58 euros to the pound.

(a) Find the cost of the hotel room per night in pounds and pence.

3

Mr and Mrs McQueen are going to Paris.
Their return flights cost £59 each.

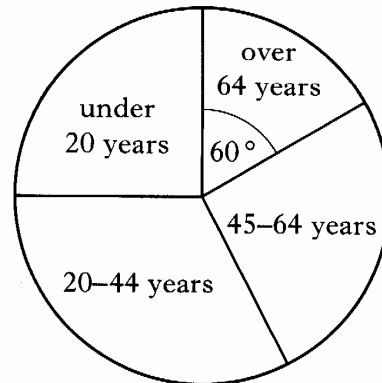
(b) Find the total cost of their flights and a 3 night stay at the Hotel Royale
in pounds and pence.

2

Marks

6. The population of Scotland in 2001 was 5 062 000.
The pie chart shows the age distribution of the population in 2001.

**Age distribution
of population
2001**

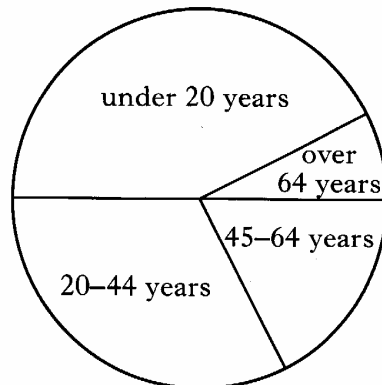


- (a) How many people were aged over 64 years?
Give your answer to the nearest thousand.

3

- (b) The pie chart below shows the age distribution of the population of Scotland in 1901.

**Age distribution
of population
1901**

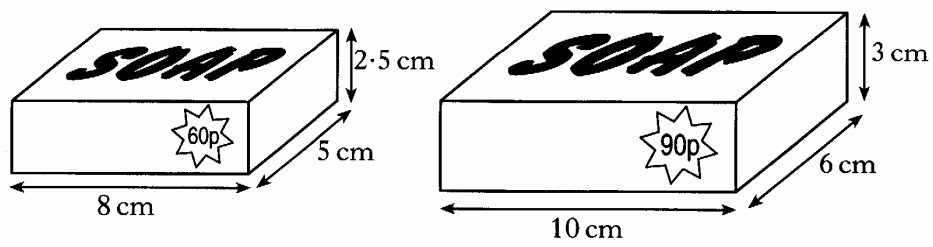


Describe the differences in the age distributions of the population of Scotland in 1901 and 2001.

2

Marks

7. The diagram below shows two bars of soap.
Each bar is in the shape of a cuboid.



- (a) Find the volume of the smaller bar.
- (b) The smaller bar costs 60 pence.
Find the cost per cubic centimetre of the smaller bar.
- (c) The larger bar costs 90 pence.
Which bar of soap gives better value for money?
Explain clearly the reason for your answer.

1

1

3

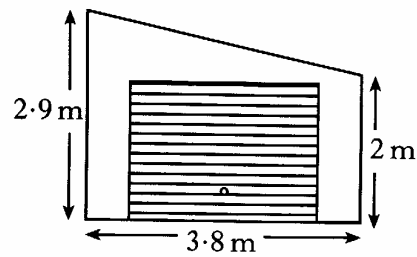
8. Use the formula below to find the value of R when $P = 180$, $M = 7.5$ and $N = 5$.

$$R = \frac{P}{MN}$$

Marks

3

9. The diagram shows the front view of a garage.



Calculate the length of the sloping edge of the roof.
Do not use a scale drawing.

3

[Turn over

Marks

10. Gail wants to insure her computer for £2400.

The insurance company charges an annual premium of £1.25 for each £100 insured.

(a) Calculate the annual premium.

2

(b) Gail can pay her premium monthly.

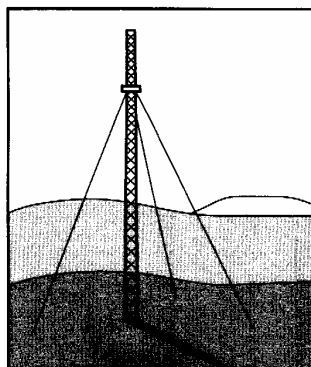
If she does this she is charged an extra 4%.

Calculate the monthly premium.

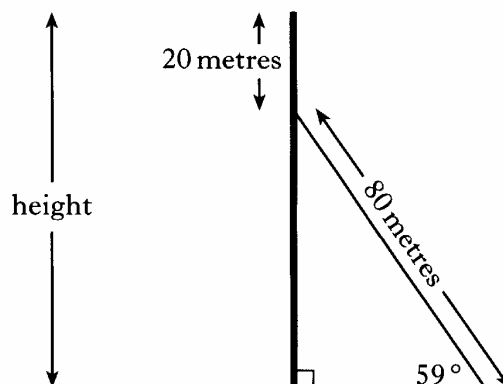
3

Marks

11. A television mast is supported by wires.



The diagram below shows one of the wires which is 80 metres long. The wire is attached to the mast 20 metres from the top and makes an angle of 59° with the ground.



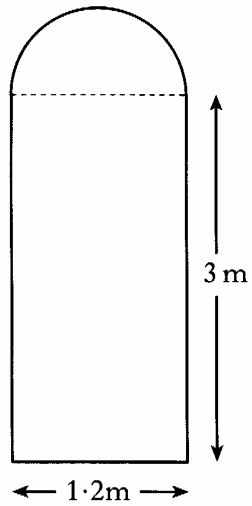
Calculate the height of the mast.
Give your answer to the nearest metre.
Do not use a scale drawing.

5

[Turn over for Question 12 on Page twelve

Marks

12. The diagram below shows a window.



The window consists of a rectangle and a semi-circle.
Calculate the area of the window.
Give your answer in square metres correct to 2 decimal places.

5

[END OF QUESTION PAPER]