

FOR OFFICIAL USE

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Total  
Mark

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NATIONAL QUALIFICATIONS 2012

# MATHEMATICS INTERMEDIATE 1

Units 1, 2 and  
Applications of Mathematics  
Paper 2



## X101/10/02

MONDAY, 21 MAY 9.55 AM – 10.50 AM

Fill in these boxes and read what is printed below.

Full name of centre

Town

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Forename(s)

Surname

Number of seat

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Date of birth

Day

Month

Year

Scottish candidate number

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- You may use a calculator.**
- 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.

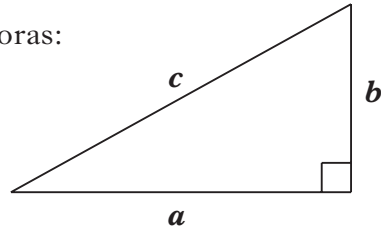
Use blue or black ink. Pencil may be used for graphs and diagrams only.



## FORMULAE LIST

Circumference of a circle:  $C = \pi d$   
Area of a circle:  $A = \pi r^2$   
Curved surface area of a cylinder:  $A = 2\pi r h$

Theorem of Pythagoras:



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



*Marks*

1. It will take Hassan 3 hours 40 minutes to drive from Dundee to Stranraer.

He must be in Stranraer by 2.15 pm.

What is the latest time he should leave Dundee?

1

**[Turn over**



Marks

2. A recipe lists the ingredients needed to make 4 portions of chilli con carne.

Ingredients for 4 portions of chilli con carne	
Minced beef	700 grams
Onions	2
Chilli powder	1 teaspoon
Kidney beans	300 grams
Chopped tomatoes	300 grams

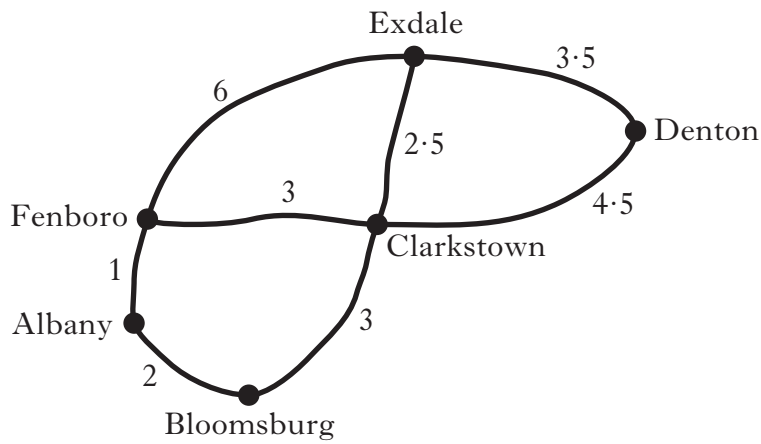
How many grams of minced beef would be needed to make 9 portions of chilli con carne?

2



Marks

3. This network diagram shows the journey times, in hours, between six cities.



- (a) How many **arcs** are there in the network diagram?

1

- (b) Calculate the shortest journey time from Albany to Denton.

1

[Turn over



Marks

4. The table below shows the **monthly payments** to be made on a loan of **£1000**.

Period of Loan	1 year	2 years	3 years	4 years
Monthly Payment on <b>£1000</b>	£87·10	£45·34	£31·45	£24·53

(a) Gavin borrows **£5000** over 3 years.  
Calculate his **total** payments.

2

(b) Calculate how much this loan cost Gavin.

1



Marks

5. Carla likes to keep fit.  
She plans a workout by choosing activities from an exercise DVD.  
She can choose from the following activities.

Activity	Activity time
Aerobics	30 minutes
Yoga	25 minutes
Jogging	20 minutes
Toning	15 minutes
Tums and Hips	12 minutes

Carla wants to choose **three** different activities.  
She wants to exercise for a **minimum** of 60 minutes.

One combination of **three** different activities that Carla can choose is shown in the table below.

Aerobics 30 minutes	Yoga 25 minutes	Jogging 20 minutes	Toning 15 minutes	Tums and Hips 12 minutes	Total Time minutes
✓	✓	✓			75

Complete the table to show **all** the possible combinations of **three** different activities that Carla can choose.

3



Marks

6. The stem and leaf diagram below shows the heights of the girls in a Primary 7 class.

**HEIGHTS  
Girls**

11	1	6		
12	2	5	9	
13	0	1	6	8 8
14	3	4	7	

12 | 5 represents 125 centimetres

- (a) What height is the tallest girl?

- (b) Find the median height.

1

1

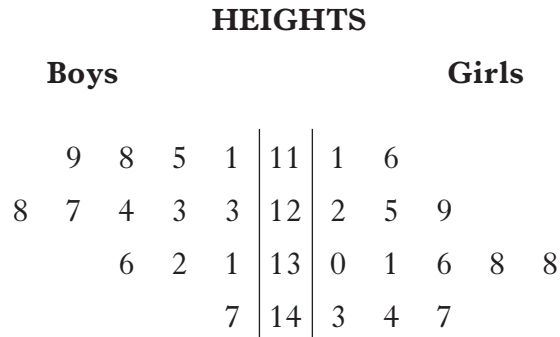




Marks

6. (continued)

The stem and leaf diagram below shows the heights of both the boys and the girls in this class.



12 | 5 represents 125 centimetres

- (c) Compare the heights of the boys with the girls in this class.  
Comment on the overall difference.

1

[Turn over



Marks

7. Five people are selling tickets for a school show.

The spreadsheet below is used to calculate the value of their ticket sales.

- Adult tickets cost £10 each
- Child tickets cost £7 each

	A	B	C	D
1		Number of Adult tickets	Number of Child tickets	Total Value (£)
2	George	15	11	227
3	Karen	12	13	211
4	Ronan	23	9	
5	Sally	29	18	
6	Jamie	18	5	
7				

- (a) The result of the formula =SUM(C2..C6) is to be entered in cell C7.

What number would appear in cell C7?

1

- (b) The total value of Jamie's ticket sales is to be entered in cell D6.

What **formula** should be used?

1



\* X 1 0 1 1 0 0 2 1 0 \*

Marks

8. The times (in seconds) taken by nine athletes to run 100 metres are shown below.

11.2    11.0    10.8    12.1    12.3    11.5    11.8    11.6    11.9

(a) Find the upper quartile.

(b) Calculate the interquartile range.

9. Whistler downhill ski course is 3.1 kilometres long.  
Finlay completed the course in 2 minutes 5 seconds.  
Find his average speed in **metres per second**.

2

2

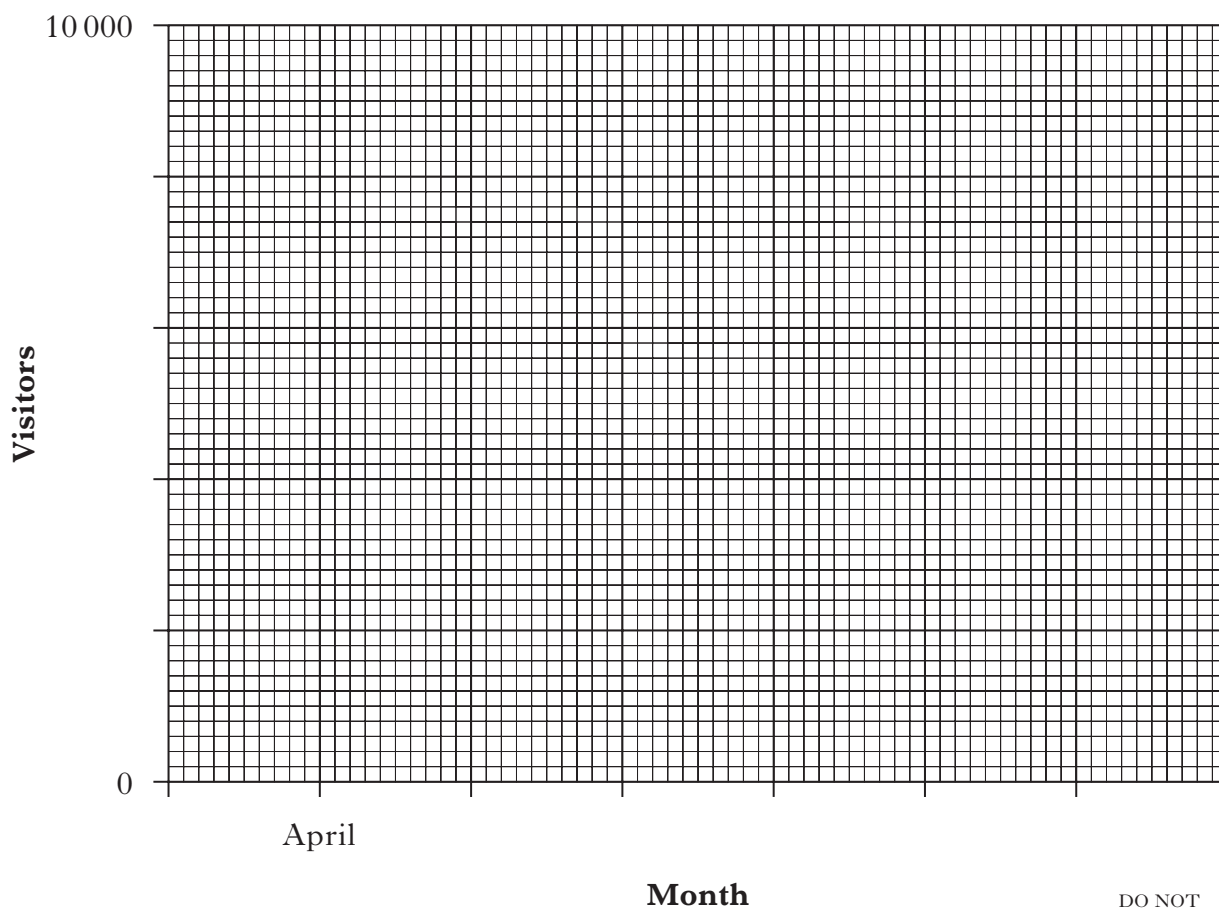
3



10. The table below shows the number of visitors to Ballyvarick Castle from April to September.

Month	April	May	June	July	August	September
Visitors (to nearest hundred)	2000	3000	4400	7800	8600	5400

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



DO NOT  
WRITE IN  
THIS  
MARGIN

Marks

4




Marks

11. Margaret insures her house which is worth £105 000.  
The annual premium is £3·20 for every £1000 worth of cover.  
She is given a discount of  $\frac{1}{8}$  of her annual premium.  
How much does Margaret pay to insure her house?



3

[Turn over



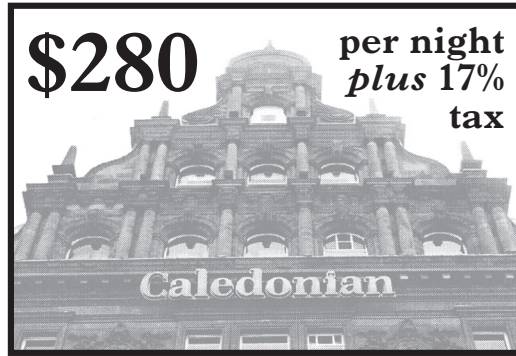
Marks

12. A room in the Caledonian Hotel in New York costs 280 dollars per night plus 17% tax.

The exchange rate is 1.51 dollars to the pound.

Find the cost of the room per night.

Give your answer in pounds and pence.

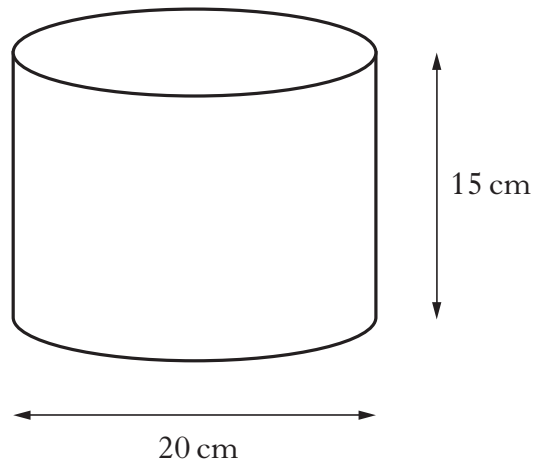


4



Marks

13. A cylinder has diameter 20 centimetres and height 15 centimetres.



Calculate the **curved** surface area of the cylinder.

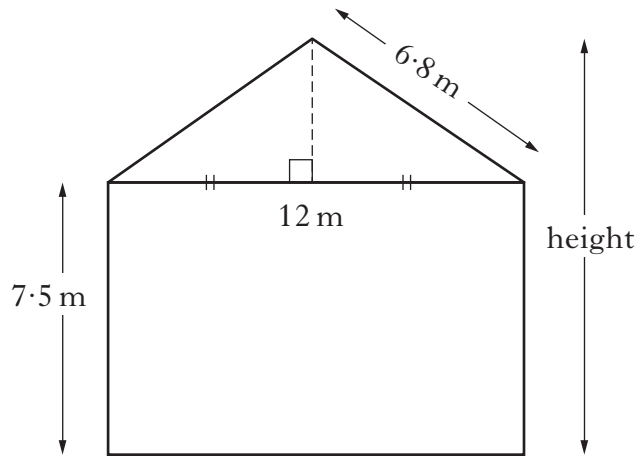
3

[Turn over



Marks

14. The diagram shows the end view of a building.



Calculate the total height of the building.  
**Do not use a scale drawing.**

4





Marks

15. A market trader buys a box of twelve shirts for £80.  
He sells them for £9 each.

(a) How much profit does he make altogether?

1

(b) Express his profit as a percentage of what he paid for the shirts.

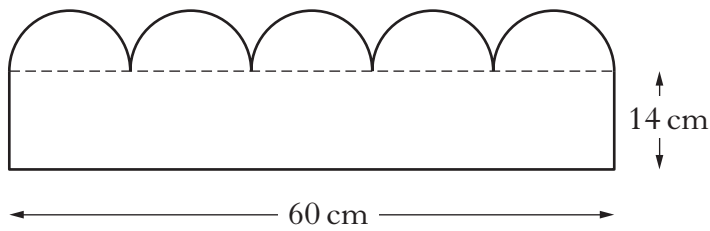
3

[Turn over for Question 16 on *Page eighteen*]



Marks

16. A section of lawn edging consists of a rectangle with five equal semi-circles at the top.



Calculate the area of the section in square centimetres.

Give your answer correct to the **nearest square centimetre**.

5

[END OF QUESTION PAPER]



ADDITIONAL SPACE FOR ANSWERS

DO NOT  
WRITE IN  
THIS  
MARGIN

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ADDITIONAL SPACE FOR ANSWERS

DO NOT  
WRITE IN  
THIS  
MARGIN

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