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Total Mark

NATIONAL QUALIFICATIONS 2012

MATHEMATICS
INTERMEDIATE 1
Units 1, 2 and
Applications of Mathematics
Paper 1 (Non-calculator)

MONDAY, 21 MAY 9.00 AM – 9.35 AM

X1011001

X101/10/01

Fill in these boxes and read what is printed below.

Full name of centre | Town

Forename(s) | Surname | Number of seat

Date of birth
Day | Month | Year | Scottish candidate number

1 **You may NOT use a calculator.**

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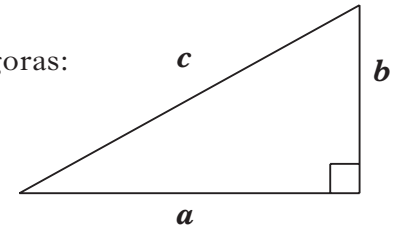
X1011001

FORMULAE LIST

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

Theorem of Pythagoras:



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

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Marks

All questions should be attempted.

1. (*a*) Find 8·31 – 5·6. **1**

(*b*) Find 0·029 × 400. **1**

(*c*) Find $\frac{2}{7}$ of 434. **1**

[Turn over

DO NOT WRITE IN THIS MARGIN

Marks

2. A college class consists of 8 male and 12 female students.

A student is chosen at random from the class.

What is the probability that the student is male?

Give your answer as a fraction in its simplest form.

2

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Marks

3. Sandie works in a factory. Her payslip for the week ending 17th March is shown below. There are **three** missing entries.

NAME:	Sandie Thompson **Week ending:** 17/3/12		
Basic Pay £229·84	**Overtime** £45·63	**Bonus** £35·00	**Gross Pay**
Income Tax £34·70	**National Insurance** £22·48	**Pension**	**Total Deductions** £76·43
			Net Pay

Calculate Sandie's:

(*a*) gross pay;

1

(*b*) net pay;

1

(*c*) pension.

2

DO NOT WRITE IN THIS MARGIN

Marks

4. Linda sells make-up. Her basic pay is £50 per week.

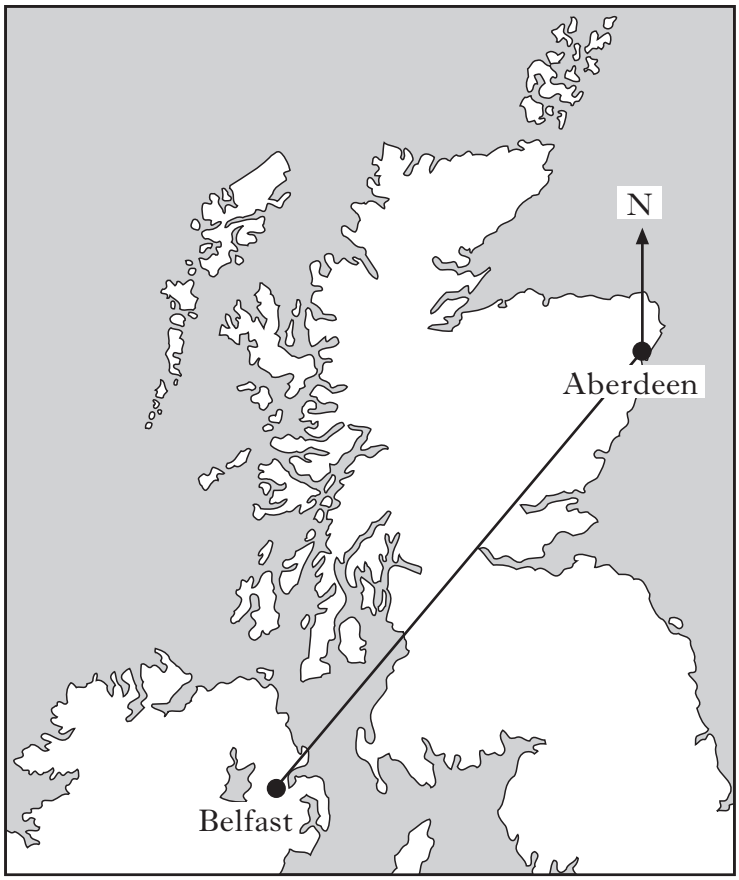
She is also paid 30% commission on all sales **over £200**.

How much is she paid altogether in a week when she sells £620 worth of make-up?

3

Marks

5. The map shows an aeroplane's flight path from Aberdeen to Belfast.



Scale: 1 cm to 50 km

Use the map to find the distance **and** bearing of Belfast from Aberdeen.

4

DO NOT WRITE IN THIS MARGIN

Marks

6. Two hundred teenagers were asked how many songs they had downloaded during the previous week.

The frequency table below shows their responses.

Number of Songs	Frequency
5	38
6	72
7	53
8	30
9	7
	Total = 200

(*a*) Write down the modal number of songs downloaded.

1

(*b*) Find the range of the number of songs downloaded.

1

DO NOT WRITE IN THIS MARGIN

Marks

6. (continued)

(*c*) Complete the table below **and** find the mean number of songs downloaded.

Number of Songs	Frequency	Number of Songs × frequency
5	38	190
6	72	432
7	53	371
8	30	
9	7	
	Total = 200	Total =

3

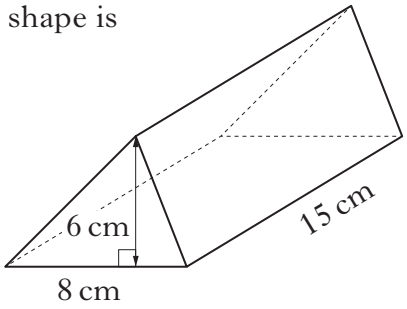
[Turn over

DO NOT WRITE IN THIS MARGIN

Marks

7. (*a*) The formula for the volume of this shape is

Volume = area of end × length



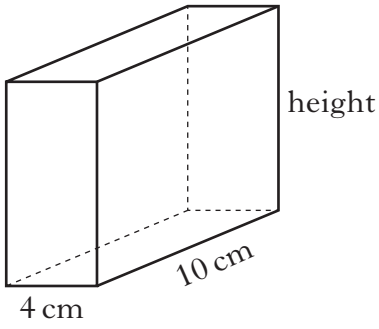
The end of this shape is a triangle.

Use the formula to work out the volume of this shape.

3

(*b*) This cuboid has the same volume as the shape shown above.

Find the height of the cuboid.



2

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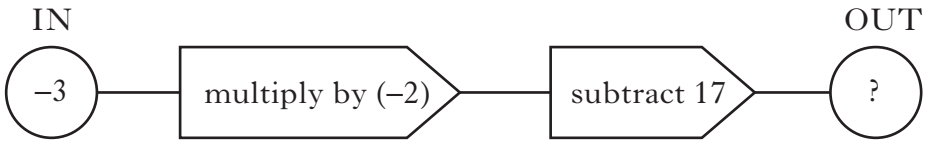
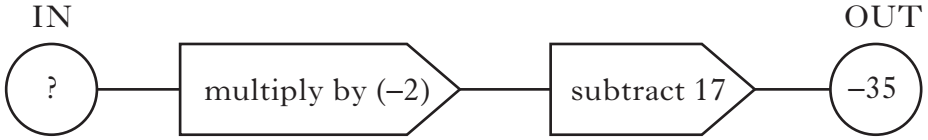
8. Find the missing number in each machine.

(*a*)



2

(*b*)



2

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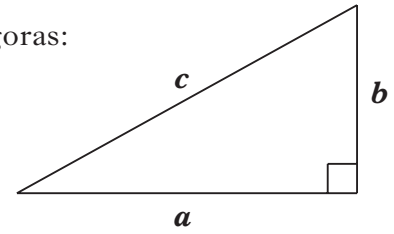

$a^2 + b^2 = c^2$

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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

DO NOT WRITE IN THIS MARGIN

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

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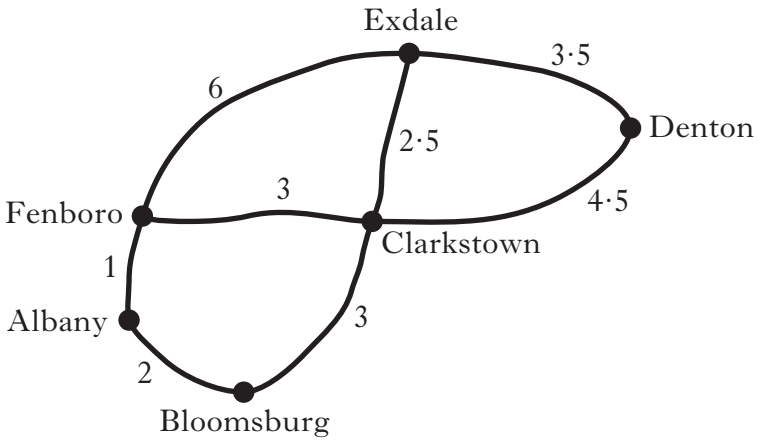
Marks

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

DO NOT WRITE IN THIS MARGIN

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 £1000	£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

DO NOT WRITE IN THIS MARGIN

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**

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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?

1

(*b*) Find the median height.

1

Marks

6. (continued)

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

HEIGHTS

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

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

DO NOT WRITE IN THIS MARGIN

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

DO NOT WRITE IN THIS MARGIN

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.

2

(*b*) Calculate the interquartile range.

2

9. Whistler downhill ski course is 3·1 kilometres long.

Finlay completed the course in 2 minutes 5 seconds.

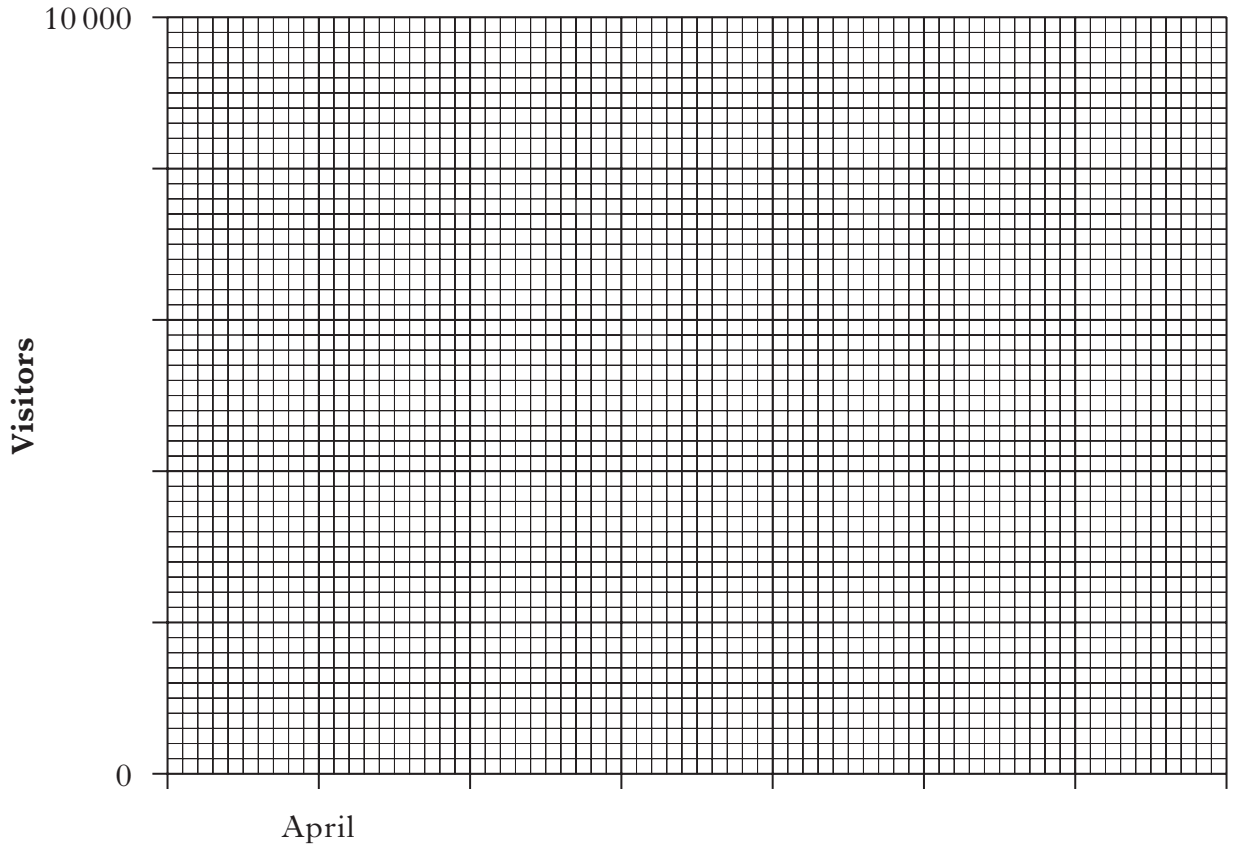
Find his average speed in **metres per second**.

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.



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4

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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

DO NOT WRITE IN THIS MARGIN

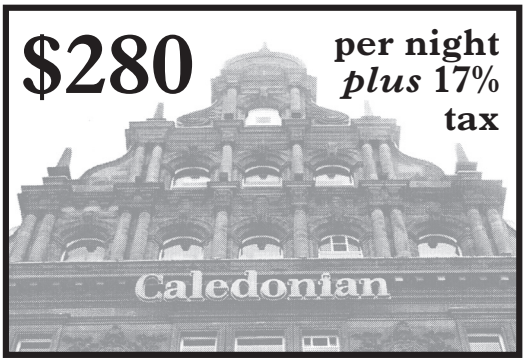
Marks

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.



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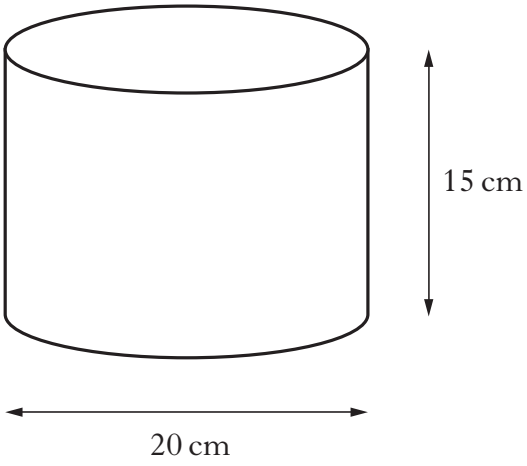
13. A cylinder has diameter 20 centimetres and height 15 centimetres.



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

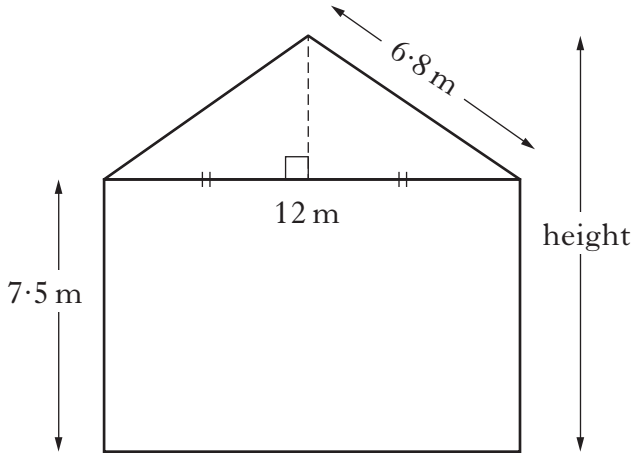
3

[Turn over

DO NOT WRITE IN THIS MARGIN

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

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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*

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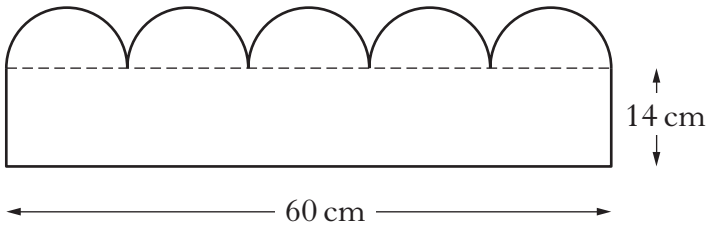
16. A section of lawn edging consists of a rectangle with five equal semi-circles at the top.



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

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