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X101/102

X101100011

Total mark

NATIONAL QUALIFICATIONS 2009

THURSDAY, 21 MAY
1.00 PM – 1.35 PM

MATHEMATICS
INTERMEDIATE 1
Units 1, 2 and
Applications of Mathematics
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

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.

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

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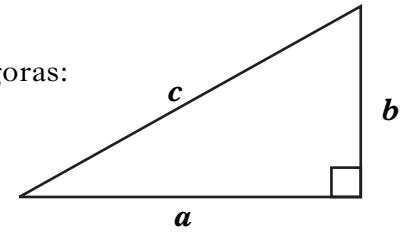
FORMULAE LIST

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:



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

DO NOT WRITE IN THIS MARGIN

ALL questions should be attempted.

Marks

1. (*a*) Find 28·7 + 4·35. **1**

(*b*) Find 1·89 ÷ 7. **1**

(*c*) Find $6 \times 4\frac{1}{3}$. **2**

2. The cost in pounds of hiring a function room is:

Cost = 250 + (number of people × 4·99)

Find the cost of hiring the function room for 200 people. **2**

[Turn over

DO NOT WRITE IN THIS MARGIN

Marks

3. Work out the answers to the following.

(*a*) $9 + (-13)$

1

(*b*) $-56 \div (-8)$

1

4. The cash price of a television is £260.

It can be bought on hire purchase by paying a deposit of 25% of the cash price and 15 instalments of £14.

Find the total hire purchase price of the television.

3

Marks

5. Sally is paid £9·50 per hour. She works 30 hours a week. Complete her payslip below.

Name: Sally Jones		**Week ending: 15/5/09**
Hours worked 30	**Hourly rate** £9·50	**Gross pay**
Tax £37·80	**National Insurance** £21·48	**Total deductions**
		Net pay

3

6. The birth weights (in kilograms) of ten babies born in a hospital in one day are shown below.

2·4 3·6 2·2 2·9 3·1 3·3 2·7 3·9 3·4 3·8

(*a*) Find the lower quartile.

2

(*b*) Calculate the interquartile range.

2

Marks

7. A group of 40 visitors to the Edinburgh Festival Fringe were asked how many performances they had attended.

The results are shown in the frequency table below.

Number of performances	Frequency
5	2
6	9
7	11
8	9
9	4
10	4
11	1
	Total = 40

(*a*) Write down the modal number of performances.

1

(*b*) Find the range of the number of performances.

1

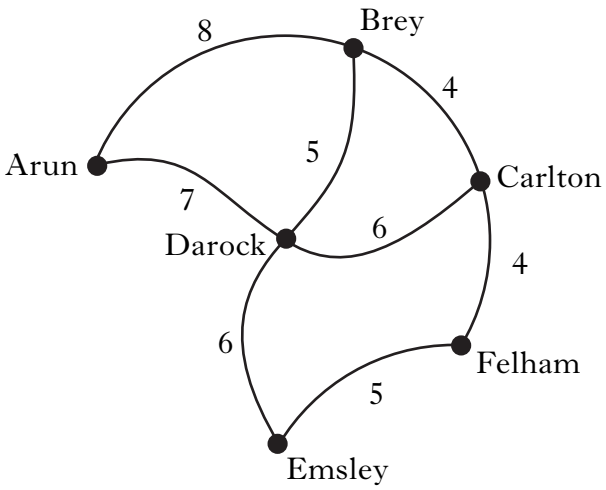
(*c*) Complete the table below **and** find the mean number of performances.

Number of performances	Frequency	Number of performances × Frequency
5	2	10
6	9	54
7	11	77
8	9	72
9	4	
10	4	
11	1	
	Total = 40	Total =

3

Marks

8. This network diagram shows the distances between six villages. All distances are in miles.



(*a*) Write down the order of the node at Darock. **1**

(*b*) Complete the distance chart below to show the **shortest** distance between each pair of villages. **2**

Arun				
8	Brey			
	4	Carlton		
7	5	6	Darock	
13	11		6	Emsley
	8	4		5 Felham

[Turn over for Question 9 on *Page eight*

Marks

9. In a quiz, three contestants are each asked 20 questions.

The contestants score

- +2 points for a correct answer
- 0 points for no answer
- –1 point for a wrong answer.

SCOREBOARD

Contestant	Points
Amy	**10**
John	**–2**
Fred	

(*a*) Fred gives 4 correct answers, 15 wrong answers and no answer to 1 question.

How many points does he score? **1**

(*b*) Amy's score for her 20 questions is 10 points.

One way that she can score 10 points is shown in the table below.

Correct answer **+2 points**	No answer **0 points**	Wrong answer **–1 point**	Total
7	**9**	**4**	**10**
			10
			10
			10
			10
			10

Complete the table to show **all** the possible ways that Amy can score 10 points. **3**

[*END OF QUESTION PAPER*]

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ADDITIONAL SPACE FOR ANSWERS

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FOR OFFICIAL USE

X101/104

X10110021

Total mark

NATIONAL QUALIFICATIONS 2009

THURSDAY, 21 MAY
1.55 PM – 2.50 PM

MATHEMATICS
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Units 1, 2 and
Applications of Mathematics
Paper 2

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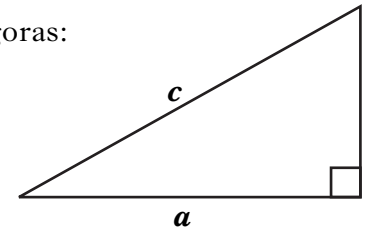


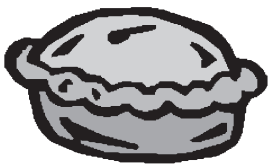
$a^2 + b^2 = c^2$

[Turn over

Marks

ALL questions should be attempted.

1. A recipe lists the ingredients needed to make 8 mincemeat pies.



Ingredients for 8 mincemeat pies	
Plain flour	60 grams
Lard	20 grams
Butter	20 grams
Mincemeat	180 grams

How many grams of plain flour would be needed to make 30 mincemeat pies?

2

DO NOT WRITE IN THIS MARGIN

Marks

2. Stefan uses this spreadsheet to calculate his car's petrol consumption. He records the distance his car travels for each quantity of petrol he buys.

	A	B	C	D
1	Date	Petrol (gallons)	Distance (miles)	Petrol Consumption (miles per gallon)
2	1 April	10	330	33
3	6 April	7	210	30
4	12 April	12	384	
5	25 April	8	276	
6	30 April	11	385	
7				

(*a*) The result of the formula =SUM(B2..B6) is to be entered in cell B7. What would appear in cell B7?

1

(*b*) What **formula** would be used to enter the petrol consumption in cell D4?

1

[Turn over

DO NOT WRITE IN THIS MARGIN

Marks

3. Jenny takes out a loan for £4500.
She is charged 14% interest on the amount borrowed.
She repays the total owed in twelve equal payments.
How much is each payment?

3

DO NOT WRITE IN THIS MARGIN

Marks

4. The number of cheese sandwiches sold by a sandwich bar was recorded for 15 days.

28	38	19	33	29
32	37	41	27	50
45	23	44	38	34

(*a*) Display this information in a stem and leaf diagram. **3**

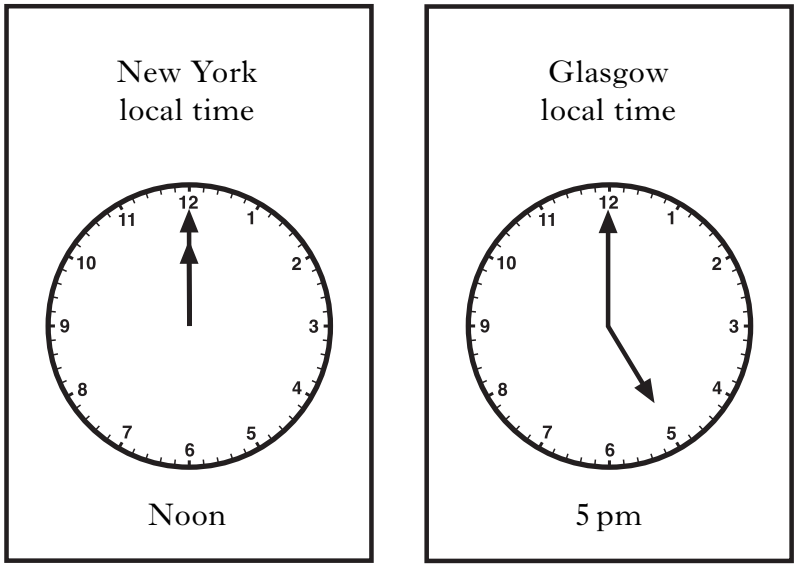
(*b*) Find the median number of cheese sandwiches sold. **1**

(*c*) Find the probability that more than 40 cheese sandwiches were sold on any day. **1**

[Turn over

Marks

5. The time in Glasgow is 5 hours ahead of the time in New York.
When it is noon in New York, it is 5 pm in Glasgow.

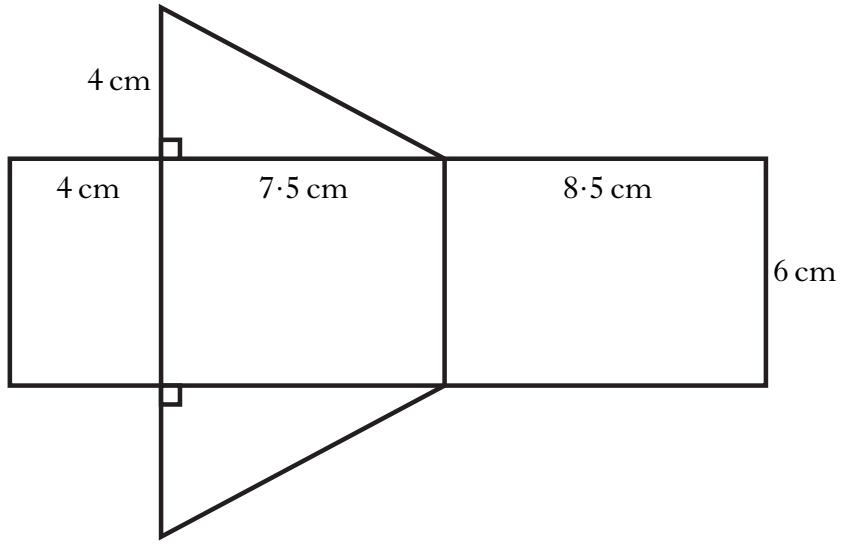


An aeroplane leaves New York at 9.20 pm local time to fly to Glasgow.
It flies 3220 miles at an average speed of 560 miles per hour.
What is the local time in Glasgow when the plane arrives?

4

Marks

6. (*a*) The diagram below shows the net of a triangular prism.

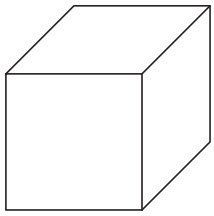


Find the total surface area of the triangular prism.

3

(*b*) This cube has the same surface area as the triangular prism shown above.

Calculate the length of one edge of the cube.



2

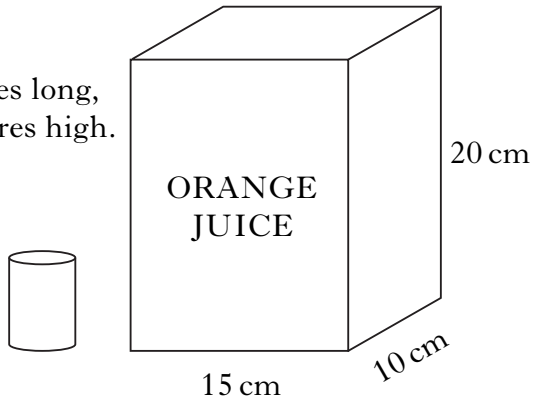
[Turn over

Marks

7. Orange juice is poured from a carton into some glasses.

The carton is a cuboid, 15 centimetres long, 10 centimetres wide and 20 centimetres high.

125 cubic centimetres of juice is poured into each glass.



How many glasses of juice can be poured from the full carton? **3**

DO NOT WRITE IN THIS MARGIN

Marks

8. Colin is going on holiday to Spain.

He wants to exchange a maximum of £1300 into euros.

The exchange rate is £1 = €1·26.

His bank only issues euros in multiples of €10.

(*a*) What is the maximum number of euros Colin will receive from his bank?

2

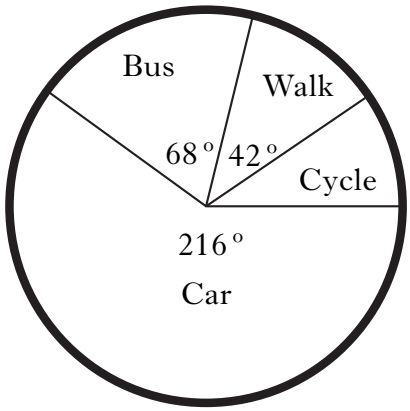
(*b*) How much will Colin actually pay for this number of euros?

2

[Turn over

Marks

9. The pie chart shows how the pupils at Newdale Academy travelled to school each day.



(*a*) There are 900 pupils at Newdale Academy.
How many pupils cycled to school?

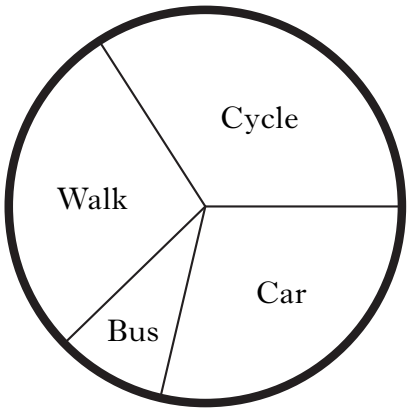
3

Marks

9. (continued)

The school ran a health promotion campaign to improve the fitness of its pupils.

The pie chart below shows how the pupils travelled to school after the campaign had been running for six months.

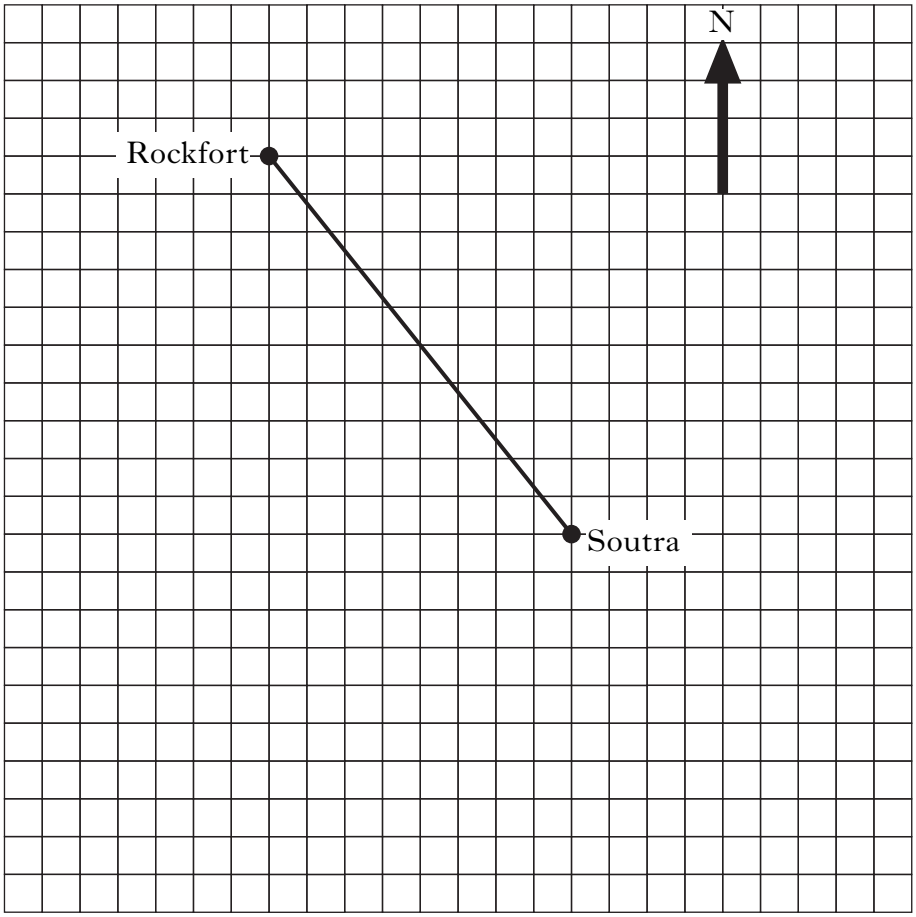


(*b*) Describe the differences in how the pupils travelled to school before and after the campaign. **2**

[Turn over

Marks

10. The scale drawing shows the position of two islands in an ocean.
The scale drawing is **1 centimetre represents 100 kilometres**.



(*a*) Use the scale drawing to find the distance in kilometres from Rockfort to Soutra. **1**

(*b*) Tern Island lies on a bearing of
- 180 ° from Rockfort
- 233 ° from Soutra.

Complete the scale drawing above to show the position of Tern Island. **3**

DO NOT WRITE IN THIS MARGIN

Marks

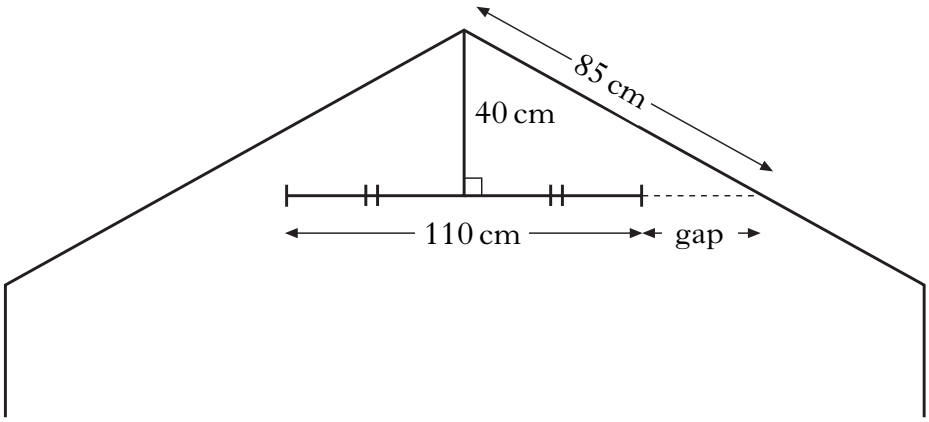
11. Last year Asim's income was £17 500.
This year his income increased to £18 200.
Calculate the increase as a percentage of last year's income.

4

[Turn over

Marks

12. The diagram below shows the position of a ceiling fan in a conservatory.



- The fan is 40 centimetres below the top of the conservatory.
- The sloping roof measures 85 centimetres to the level of the fan.
- The fan measures 110 centimetres across.

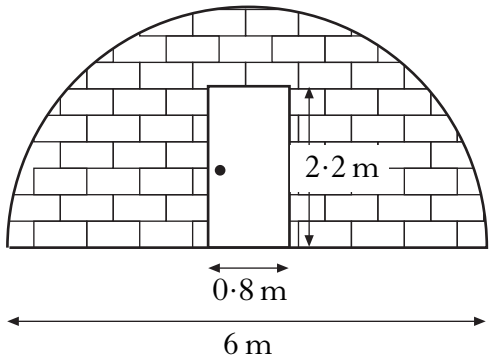
Calculate the size of the gap between the edge of the fan and the sloping roof.

Do not use a scale drawing.

4

Marks

13. The diagram below shows a semi-circular wall with a door.



The door is a rectangle and is made of wood.
The rest of the wall is made of brick.
Calculate the area of brick wall in square metres.
Give your answer correct to one decimal place.

5

[*END OF QUESTION PAPER*]

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