

FOR OFFICIAL USE

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**X100/103**



Total  
mark

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NATIONAL  
QUALIFICATIONS  
2009

THURSDAY, 21 MAY  
1.55 PM – 2.50 PM

**MATHEMATICS**  
**INTERMEDIATE 1**  
Units 1, 2 and 3  
Paper 2

**Fill in these boxes and read what is printed below.**

Full name of centre

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Town

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Forename(s)

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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 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.

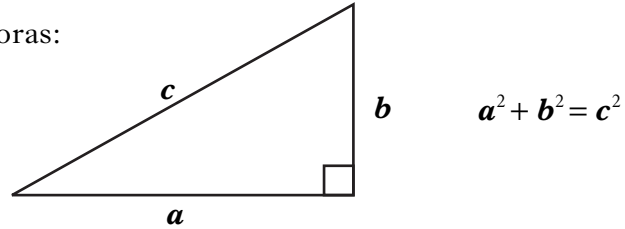
Use blue or black ink. Pencil may be used for graphs and diagrams only.



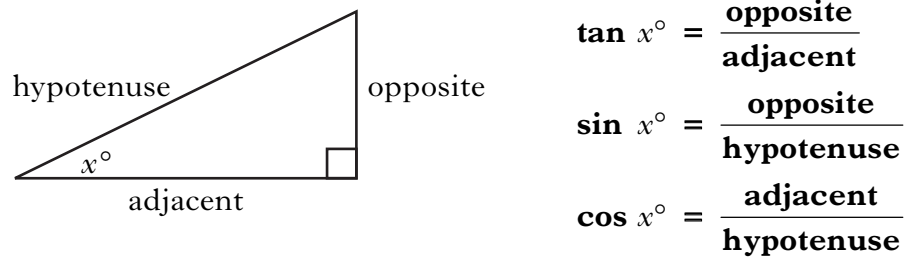
## FORMULAE LIST

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

Theorem of Pythagoras:



Trigonometric ratios  
in a right angled  
triangle:



**ALL questions should be attempted.**

Marks

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

<b>Ingredients for 8 mincemeat pies</b>	
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

2. Solve algebraically the inequality

$$2m - 3 < 75.$$

2

[Turn over

*Marks*

3. (a) Write  $1.02 \times 10^7$  in full.

1

(b) Work out the difference between  $1.02 \times 10^7$  and  $\frac{3}{4}$  million.

2

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

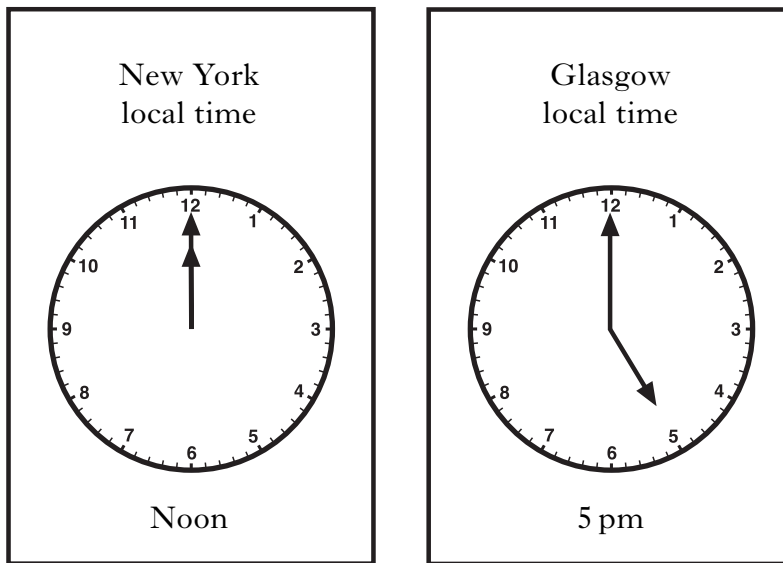
- (c) Find the probability that more than 40 cheese sandwiches were sold on any day.

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

6. (a) Multiply out the brackets and simplify

$$3(2t + 5) + 2(7 - t).$$

Marks

3

(b) Factorise

$$12p - 20.$$

2

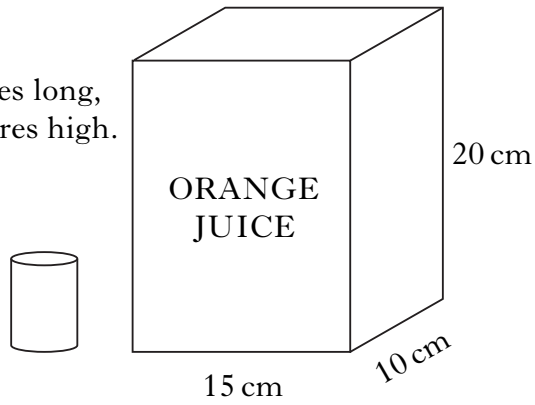
[Turn over

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

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

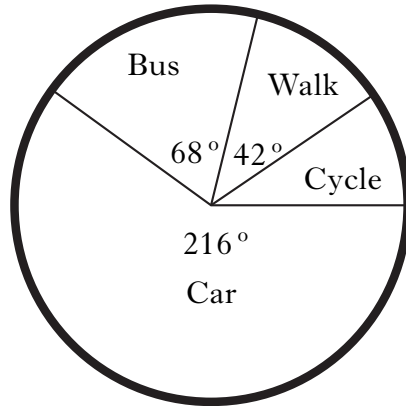
- (b) How much will Colin actually pay for this number of euros?

2

[Turn over

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

Marks



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

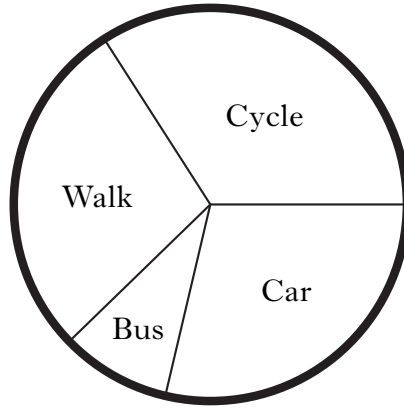
3

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.



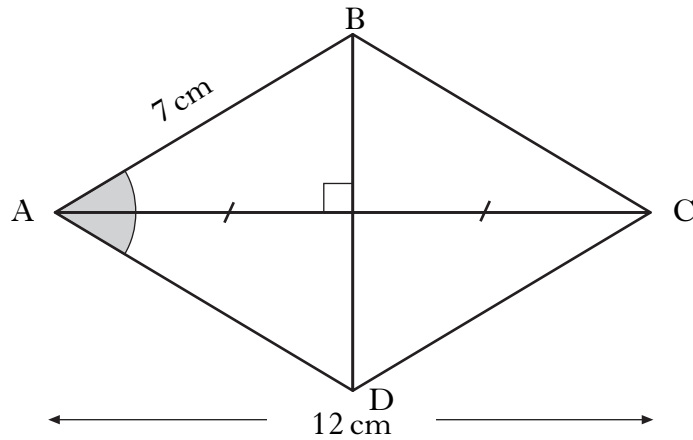
(b) Describe the differences in how the pupils travelled to school before and after the campaign.

2

[Turn over

Marks

10. ABCD is a rhombus.  
Side AB is 7 centimetres and diagonal AC is 12 centimetres as shown.



Calculate the size of the shaded angle BAD.

**Do not use a scale drawing.**

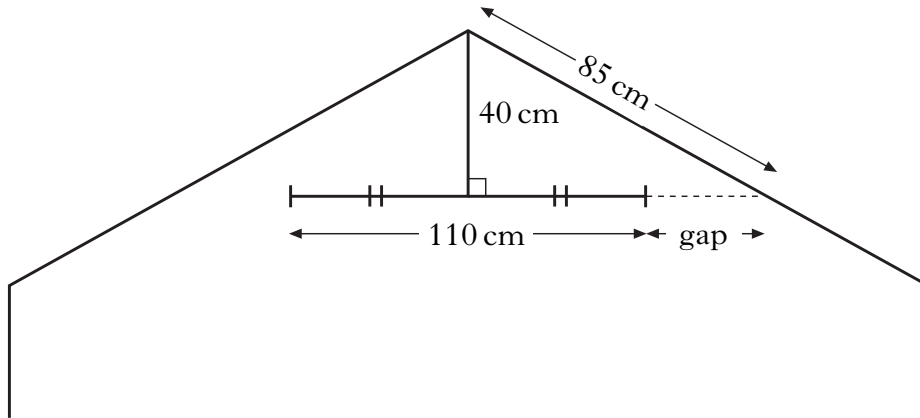
4

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

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.

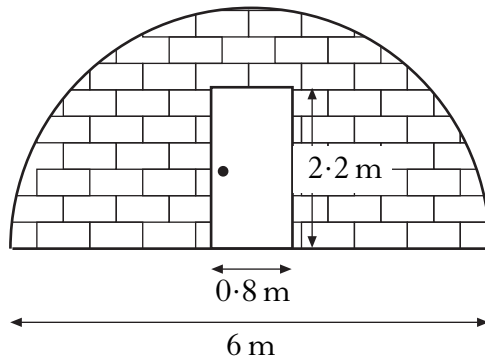
**Do not use a scale drawing.**

4

[Turn over for Question 13 on Page fourteen

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]

**ADDITIONAL SPACE FOR ANSWERS**

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