

FOR OFFICIAL USE

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Total
Mark

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NATIONAL QUALIFICATIONS 2015

MATHEMATICS
INTERMEDIATE 1
 Units 1, 2 and 3
 Paper 2

X100/10/02

TUESDAY, 19 MAY
1.55 PM – 2.50 PM



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

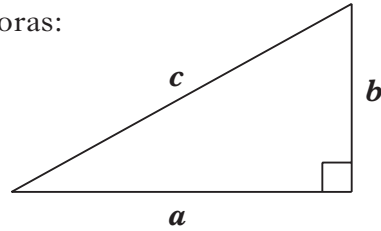
Circumference of a circle:

$$C = \pi d$$

Area of a circle:

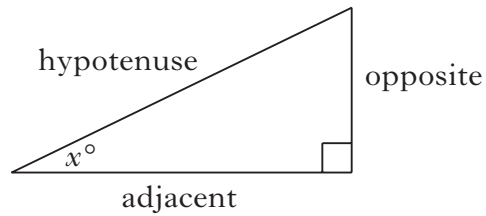
$$A = \pi r^2$$

Theorem of Pythagoras:



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

Trigonometric ratios
in a right angled
triangle:



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

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

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



Marks

1. This information appears on a carton of fruit juice.

NUTRITION INFORMATION	
per 100 ml	
Energy	48 kcal
Protein	0.6 g
Carbohydrate	10.8 g
Vitamin C	34 mg

How much protein is in a 250 ml glass of fruit juice?

2. Last year the National Bank made a profit of £970 million.
Write this amount in standard form.

2

2

[Turn over



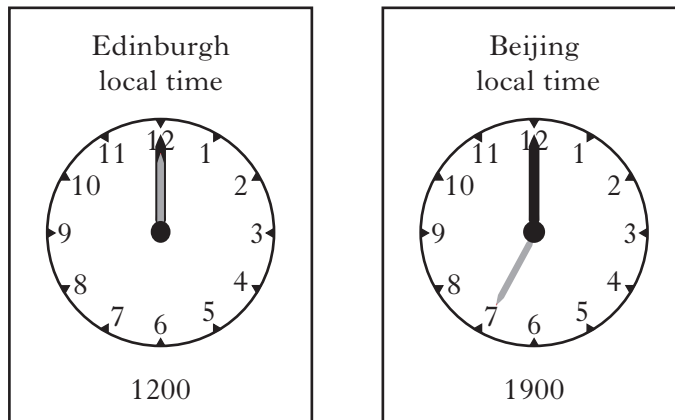
Marks

3. Solve algebraically the inequality

$$7m + 5 < 68.$$

2

4. The time in Beijing is 7 hours ahead of the time in Edinburgh.
When it is 1200 in Edinburgh it is 1900 in Beijing.



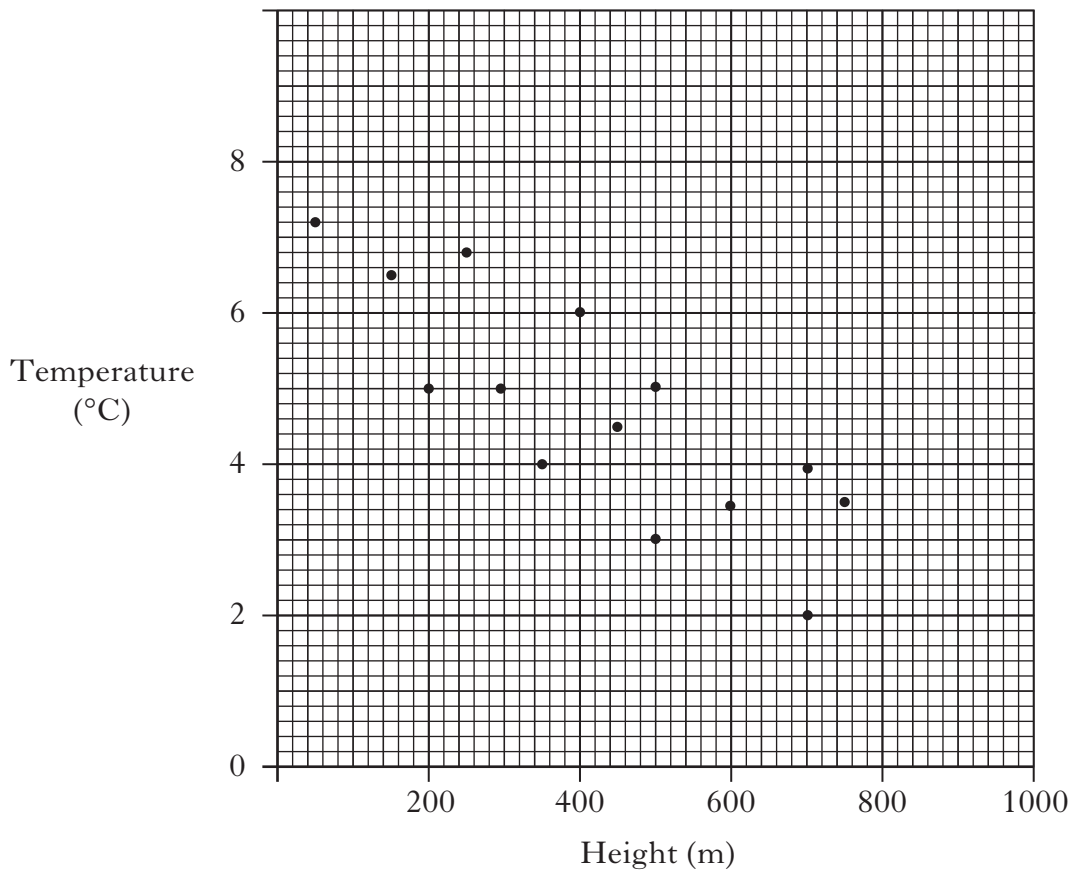
Paul leaves Edinburgh on Monday at 0945 to fly to Beijing.
His journey takes 13 hours 25 minutes in total.
What is the local time when he arrives in Beijing?

2



Marks

5. A hillwalker notes the temperature at various heights during a walk one day. The scattergraph shows the results.



- (a) Draw a line of best fit through the points on the graph.
- (b) Use your line of best fit to estimate the temperature at a height of 900 metres.

1

1

[Turn over



Marks

6. (a) Multiply out the brackets and simplify

$$4(5u + 11) + 3(1 - 2u).$$

- (b) Factorise

$$12w + 18.$$

3

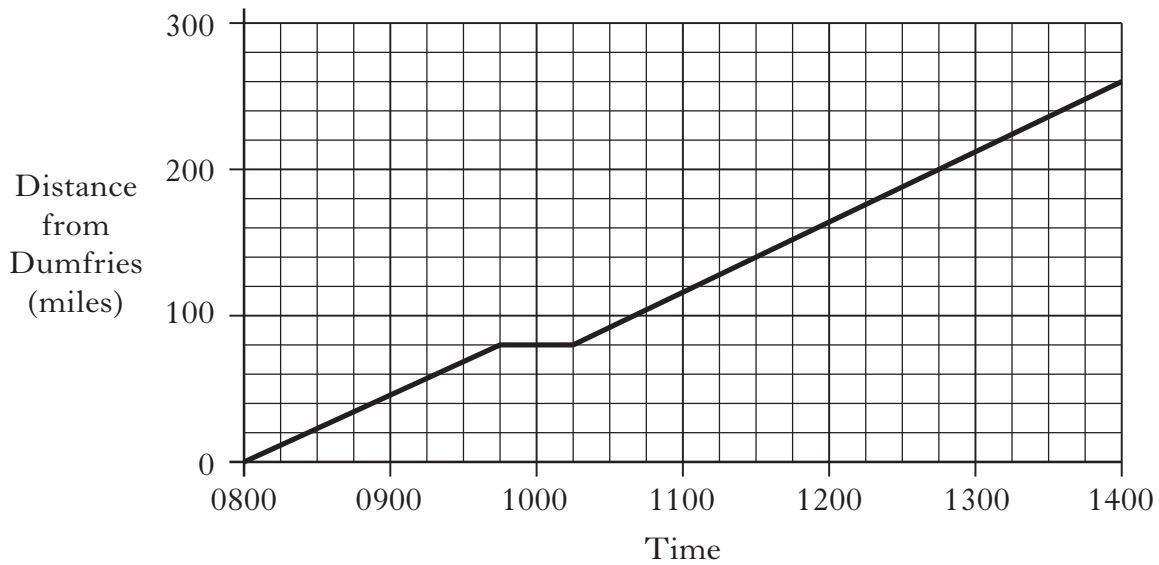
2



Marks

7. Amir travels by train from Dumfries to Glasgow where he then catches another train to Inverness.

His journey is shown on the graph below.



- (a) How long does he spend waiting in Glasgow?

1

- (b) Calculate the average speed of the train from Glasgow to Inverness.

3



Marks

8. The following items are on sale at an Eastlife concert.

T-shirt	£12
Signed Photograph	£8
Baseball Cap	£6
Poster	£5
Fluorescent Stick	£2

Rebecca wants to buy **three different** items.

She wants to spend a **maximum** of £20.

One combination of **three different** items that Rebecca can buy is shown in the table below.

T-shirt £12	Signed Photograph £8	Baseball Cap £6	Poster £5	Fluorescent Stick £2	Total Cost £
		✓	✓	✓	13

Complete the table to show **all** the possible combinations of **three different** items that Rebecca can buy.

3



Marks

9. Shoppers at two stores, Lido and Eldi, were asked how much they spent on their last visit to the store.

Listed below are the amounts (in £) spent by ten shoppers at Lido.

48 37 42 57 81 73 64 61 72 39

- (a) Find the median.

- (b) Find the range.

Another ten shoppers were asked at Eldi.

The median was £67 and the range was £28.

- (c) Make **two** comments comparing the amounts spent by the shoppers at the Lido and Eldi stores.

2

1

2

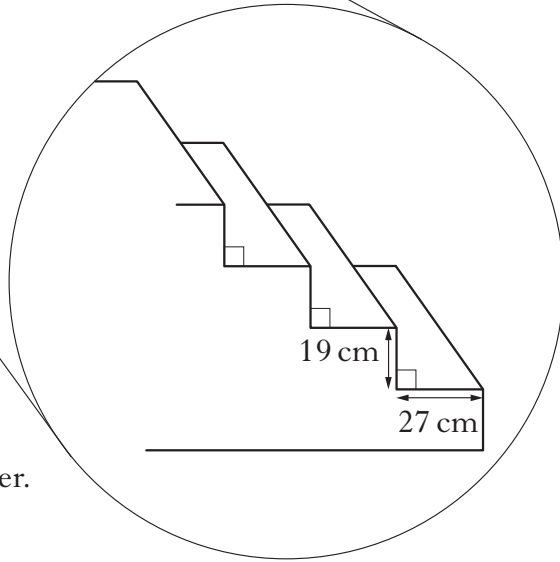
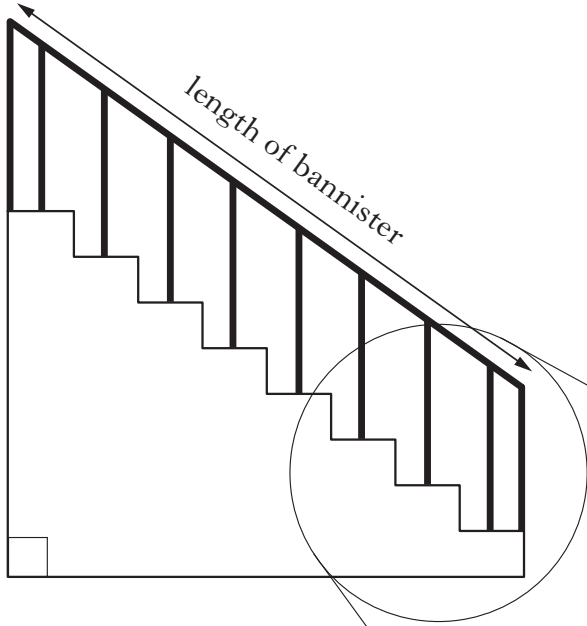
[Turn over



10. A flight of eight stairs has a bannister attached.

DO NOT
WRITE IN
THIS
MARGIN

Marks



Each stair has the dimensions shown here.

Calculate the length of the bannister.

Do not use a scale drawing.

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4



Marks

11. Gina travelled from Rome to Aberdeen where she changed 1500 euros into pounds.

She spent £875 in Aberdeen and then changed the rest into Swiss francs before travelling to Zurich.

How many Swiss francs did Gina receive?

Exchange Rates

£1 = 1.25 euros

£1 = 1.44 Swiss francs

3

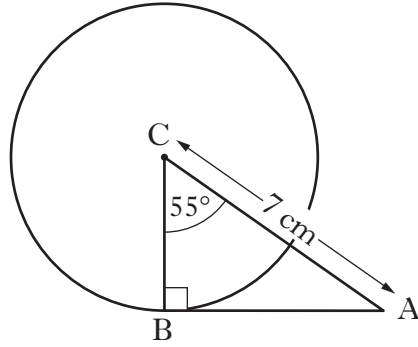
[Turn over



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

Marks

12. ABC is a right-angled triangle.
B lies on the circumference of a circle with centre C.
The length of AC is 7 centimetres and the size of angle ACB is 55° .



Calculate the length of the diameter of the circle.

Do not use a scale drawing.

4



Marks

13. Stuart borrows £4500 from a bank.
The rate of interest is 7·8% per annum.
Calculate the interest he owes after eleven months.

3

14. During a sale the price of a roll of wallpaper is reduced from £5·25
to £3·99.
Calculate the percentage reduction in the price of the roll of wallpaper.

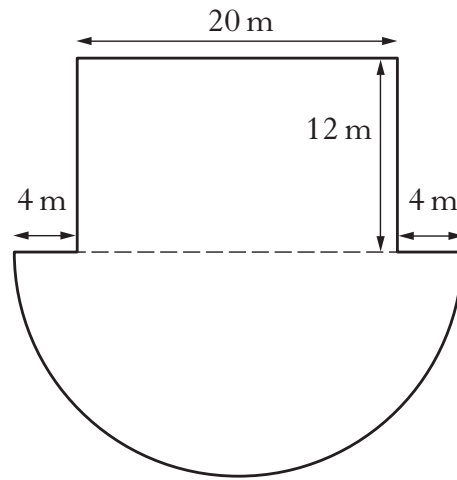
4

[Turn over for Question 15 on Page fourteen]



Marks

15. The floor plan of a concert hall is shown below.



The stage is a rectangle and the seating area is a semi-circle.
Calculate the total area of the stage and seating area.
Give your answer correct to the **nearest square metre**.

5

[END OF QUESTION PAPER]



ADDITIONAL SPACE FOR ANSWERS

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WRITE IN
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MARGIN

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* X 1 0 0 1 0 0 2 1 5 *

ADDITIONAL SPACE FOR ANSWERS

DO NOT
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* X 1 0 0 1 0 0 2 1 6 *