

FOR OFFICIAL USE

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Total
Mark

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X101/102

NATIONAL
QUALIFICATIONS
2011

WEDNESDAY, 18 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

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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 **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.
- 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.

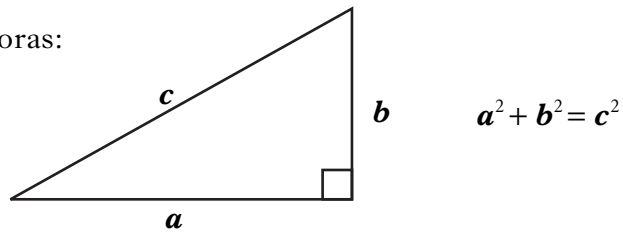
Use blue or black ink. Pencil may be used for graphs and diagrams only.



FORMULAE LIST

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

Theorem of Pythagoras:



Marks

ALL questions should be attempted.

1. (a) Find $6.47 + 13.9$.

1

(b) Find $\frac{5}{8}$ of 360.

1

(c) Find 12×13 .

1

[Turn over

Marks

2. An overnight ferry left Lerwick at 1745 and arrived in Aberdeen at 0720 the next morning.
How long did the journey from Lerwick to Aberdeen take?

1

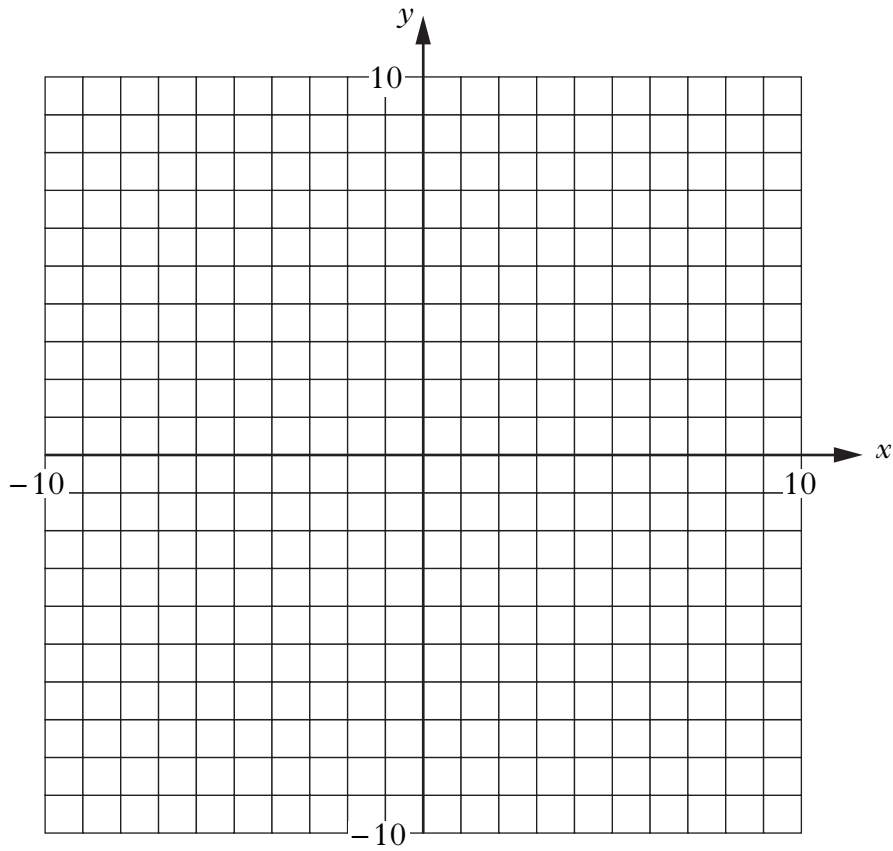
3. Work out the answer to

$$17 - 4 \times (-2).$$

2

Marks

4. (a) On the grid below, plot the points $P(-7,2)$ and $Q(5,-6)$.



- (b) Draw a line joining P to Q.
The point R is halfway along this line.
Write down the coordinates of R.

1

1

[Turn over

Marks

5. The fare charged by a taxi firm is:

£3 for the first 500 metres of a journey
plus 50p for **each additional** 500 metres.

(a) Find the fare charged for a journey of 1500 metres.

2

(b) The fare charged for another journey is £7.
What distance is the journey?

2

Marks

6. The spreadsheet below is used to work out the number of points scored by each team in a hockey tournament.

	A	B	C	D	E
1	TEAM	Wins	Draws	Losses	Points
2	Forth	5	2	1	
3	Tay	4	3	1	15
4	Clyde	2	5	1	11
5	Solway	1	4	3	7
6	Moray	0	2	6	2
7					

- (a) The result of the formula $=3*B2+C2$ is to be entered in cell E2. What number would appear in cell E2?

1

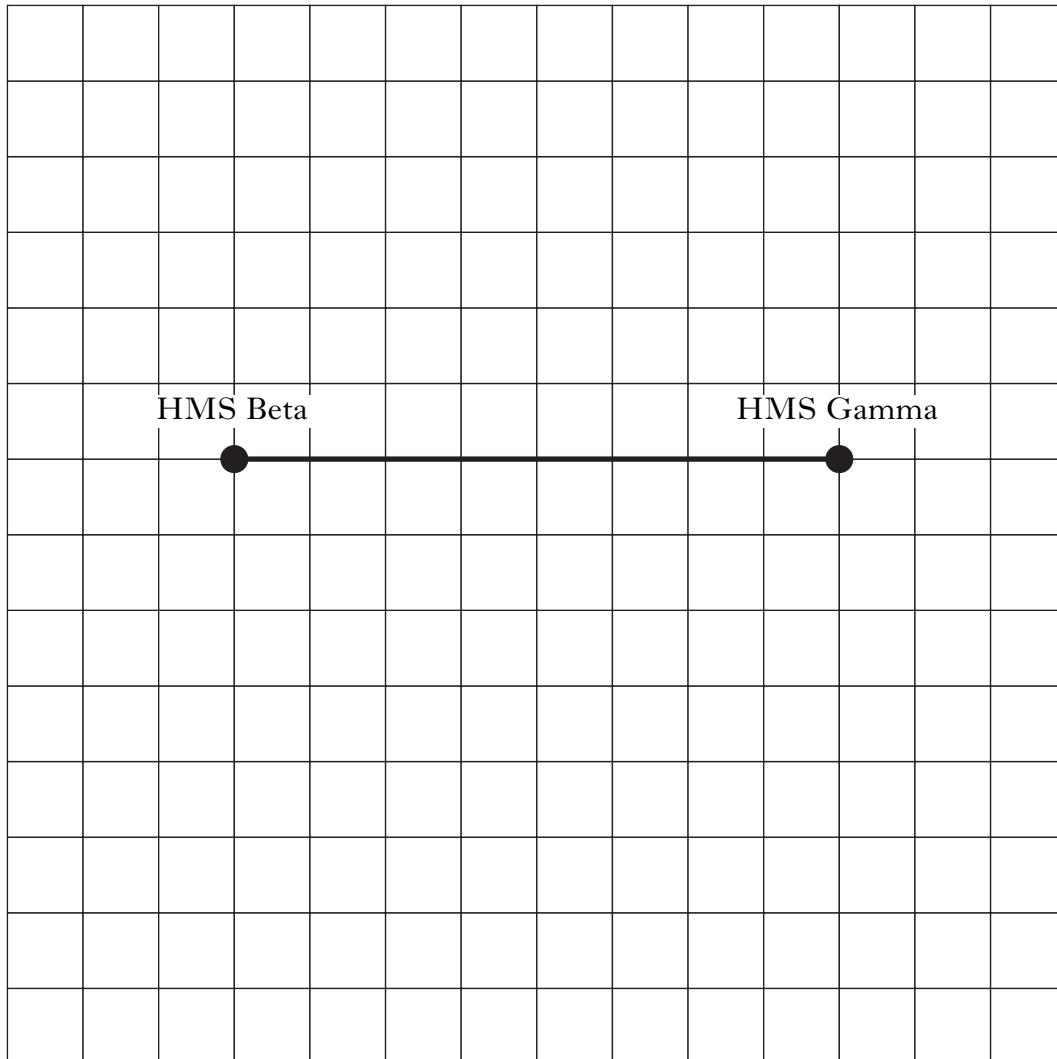
- (b) The average number of points is to be entered in cell E7. What formula should be used?

1

[Turn over

Marks

7. The scale drawing shows the positions of two ships, HMS Beta and HMS Gamma, which are 200 kilometres apart.



- (a) Find the scale of the drawing.

2

- (b) A third ship, HMS Delta, is on a bearing of
- 150° from HMS Beta
 - 225° from HMS Gamma.

Complete the scale drawing above to show the position of HMS Delta.

3

Marks

8. Thirty students were given homework.

The frequency table shows the length of time each student spent on the homework.

Time (minutes)	Frequency
5	1
10	6
15	11
20	7
25	5
	Total = 30

- (a) Write down the modal time spent on the homework.

1

- (b) What is the probability that a student, picked at random, spent 20 minutes on the homework?

1

- (c) Complete the table below **and** find the mean time spent on the homework.

Time (minutes)	Frequency	Time \times Frequency
5	1	5
10	6	60
15	11	165
20	7	
25	5	
	Total = 30	Total =

3

[Turn over

Marks

9. Margaret has £200 worth of gift vouchers for a jewellery shop. She wants to buy some of the items shown below.

Bracelet	Pendant	Earrings	Bangle	Charm
£105	£80	£55	£50	£30

Margaret wants to buy **three** items.

She can spend a **maximum** of £200.

She does not want to buy more than one of each item.

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

Bracelet £105	Pendant £80	Earrings £55	Bangle £50	Charm £30	Total Value (£)
	✓	✓	✓		185

Complete the table to show **all** the possible combinations of items that Margaret can buy.

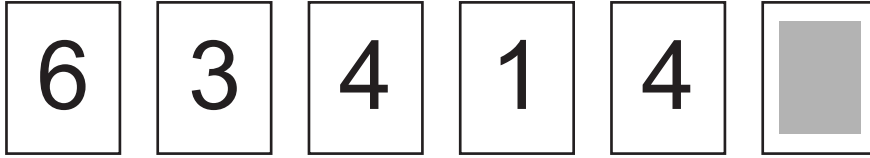
3

Marks

10. Each card in a pile has a number printed on it.

(a) Seonaid selects these six cards from the pile.

The number on the last card is hidden.



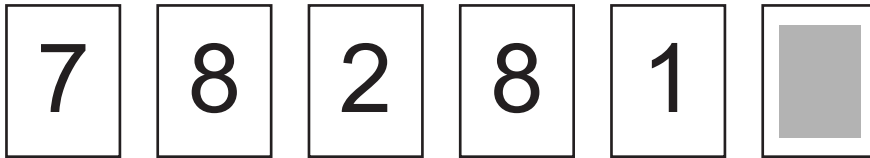
The range of the numbers on the **six** cards is 8.

Find the hidden number.

1

(a) Kirsty selects these six cards from the pile.

The number on the last card is hidden.



The mean of the numbers on the **six** cards is 5.

Find the hidden number.

2

[END OF QUESTION PAPER]

ADDITIONAL SPACE FOR ANSWERS

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Mark

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2011

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1.55 PM – 2.50 PM

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Paper 2

Fill in these boxes and read what is printed below.

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Scottish candidate number

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Number of seat

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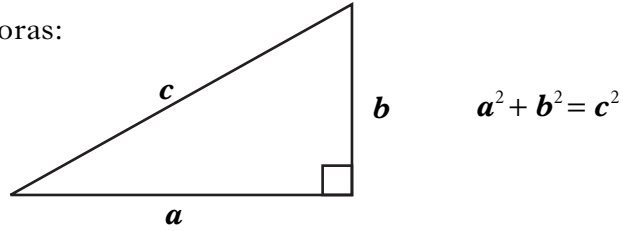
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Marks

ALL questions should be attempted.

1. Sohail burns off 160 calories when he runs for 20 minutes.
For how many minutes would he need to run to burn off 400 calories?

2

2. The table below shows the **monthly payments** to be made when money is borrowed from a credit union.

Amount borrowed	6 months	12 months	18 months	24 months	30 months
£500	£86.30	£44.43	£30.50	£23.54	£19.40
£1000	£172.60	£88.85	£60.99	£47.08	£38.80
£2000	£345.20	£177.70	£121.98	£94.15	£77.60
£5000	£863.00	£444.25	£304.98	£235.40	£194.00

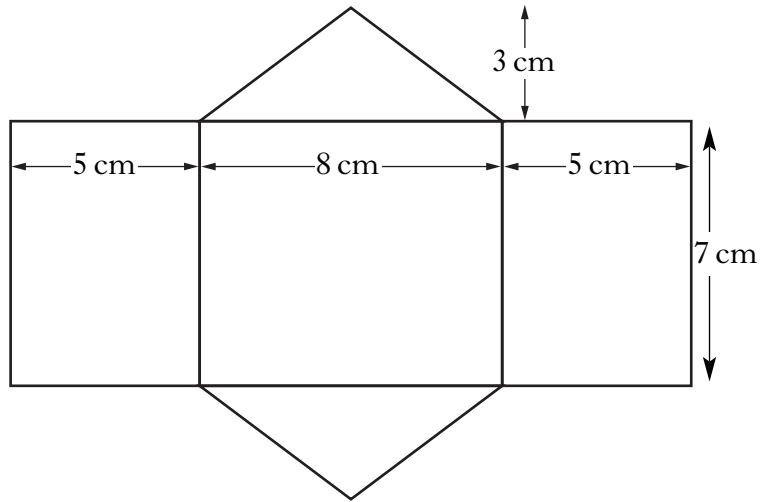
Fred borrows £1000 over 2 years.
Calculate his **total** payments.

2

[Turn over

Marks

3. The diagram below shows the net of a triangular prism.

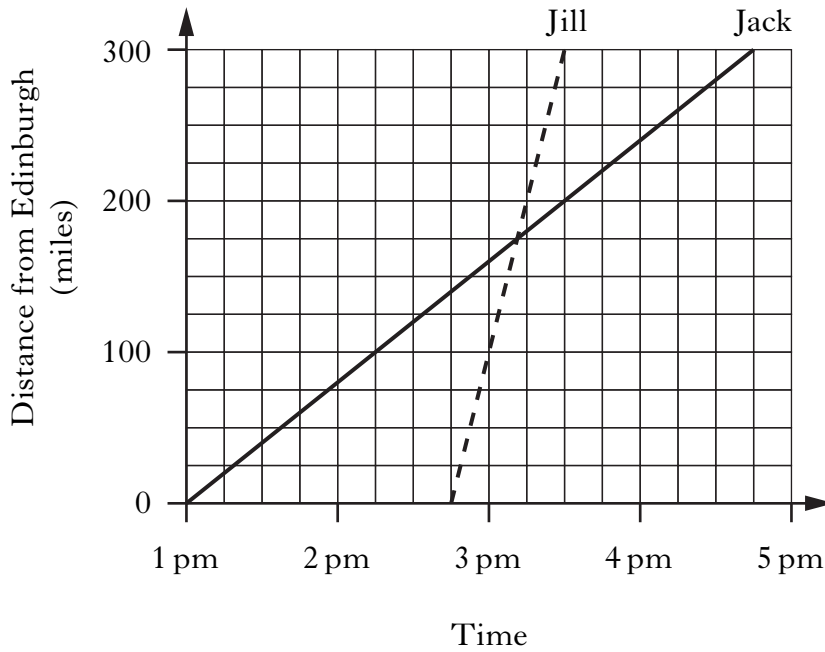


Find the total surface area of the triangular prism.

3

Marks

4. Jack and Jill travel from Edinburgh to Birmingham.
Jack travels by train and Jill travels by aeroplane.
The graph below shows their journeys.



- (a) How much sooner than Jack does Jill arrive in Birmingham?

1

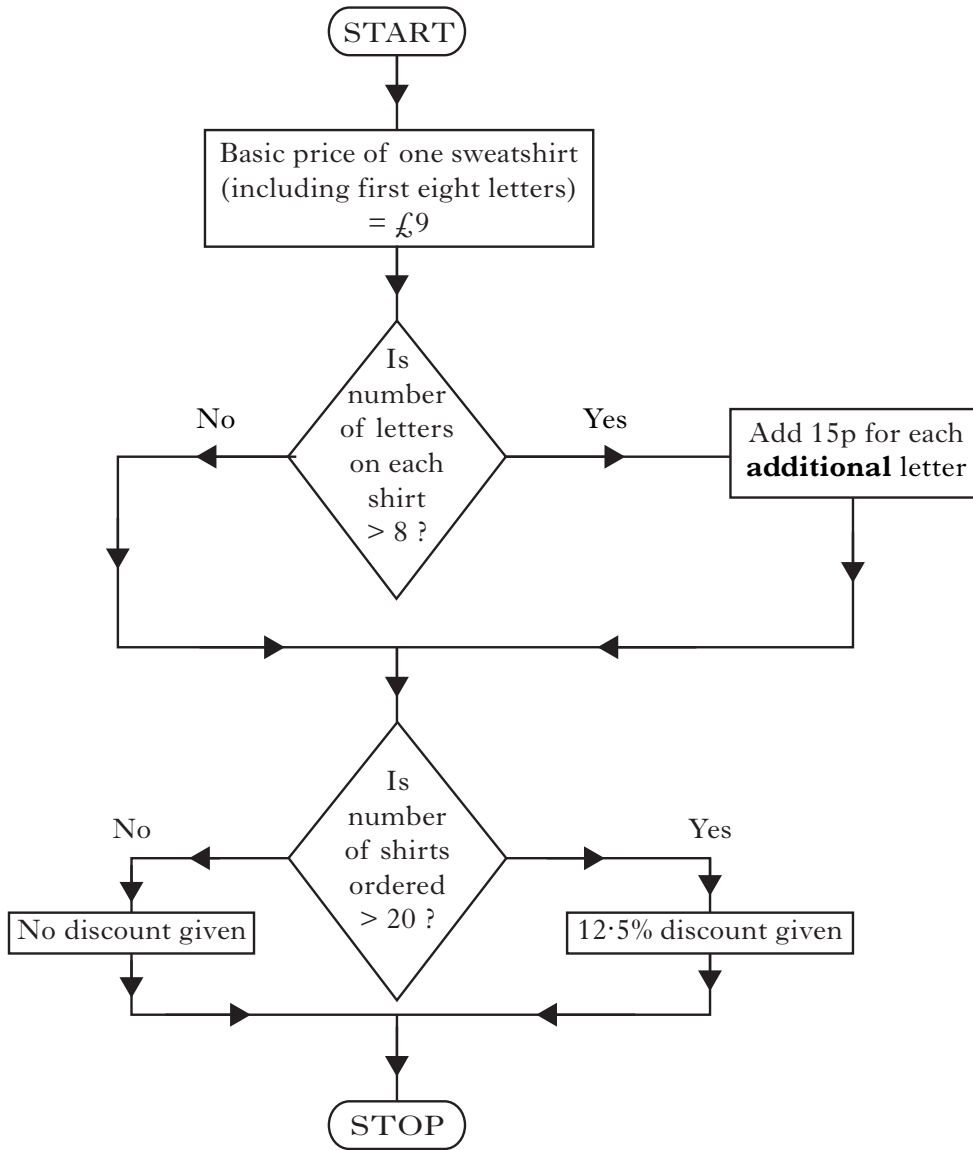
- (b) Calculate the average speed, in miles per hour, of Jack's journey.

3

Marks

5. A football club orders 25 sweatshirts with the club name STRATH UNITED printed on them.

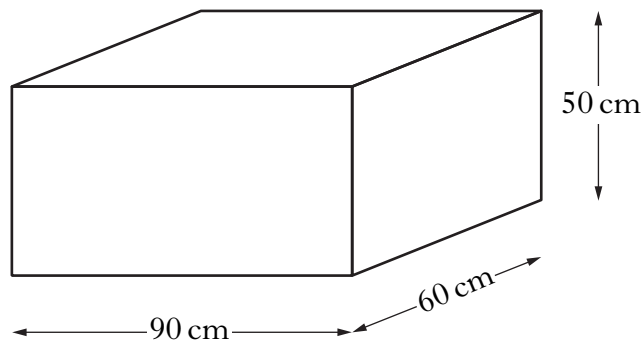
This flowchart is used to calculate the cost of the order.



Calculate the total cost of the order for 25 sweatshirts with the name STRATH UNITED printed on them.

Marks

6. This empty tank is to be filled with water.



The tank is a cuboid, 90 centimetres long, 60 centimetres wide and 50 centimetres high.

The water fills at a rate of 15 litres every minute. (1 litre = 1000 cm³)

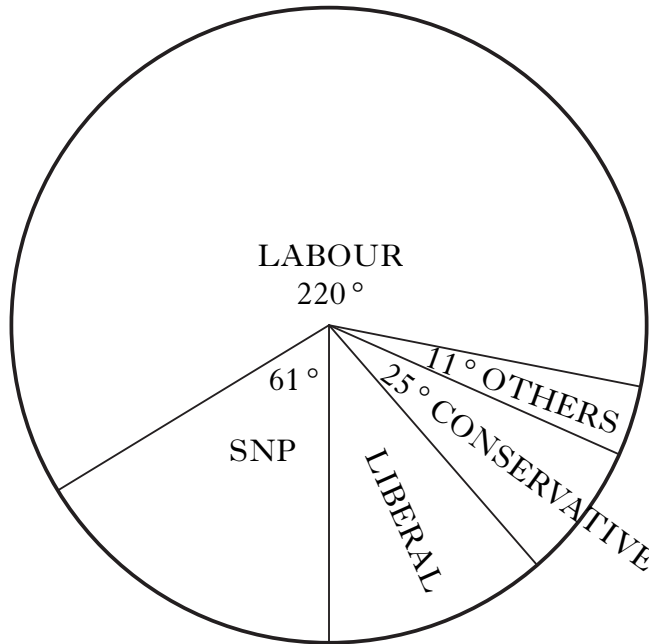
How long will it take to fill the tank?

4

[Turn over

7. The pie chart shows the share of the votes received by candidates in the Gleniston constituency at the general election in 2005.

Marks



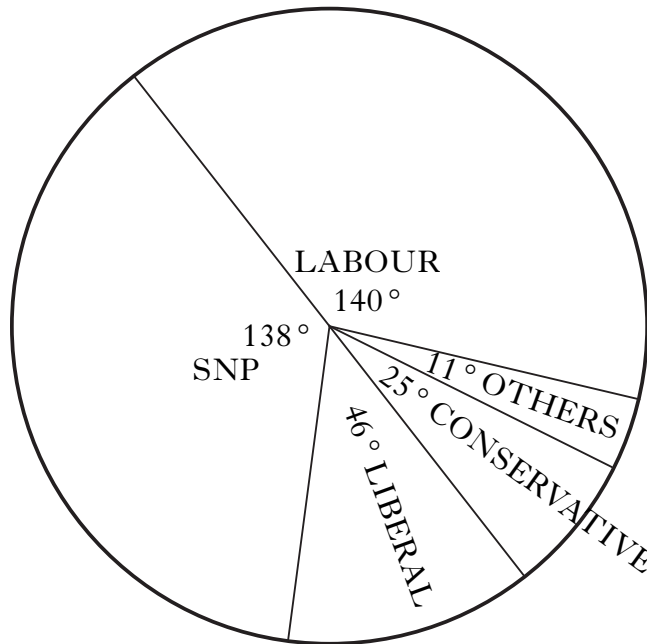
- (a) A total of 30 960 people voted in the Gleniston constituency. How many people voted for the Liberal candidate?

3

Marks

7. (continued)

The pie chart below shows the share of the votes received by candidates in the Gleniston constituency at the by-election in 2008.



(b) Describe the **differences** in the share of the votes received by candidates in the by-election in 2008 and the general election in 2005.

2

[Turn over

Marks

8. Last year Mark rented a villa in Spain in April and October.
In April the villa cost him £800.
In October it cost the same number of **euros** as it did in April.
How much, in pounds and pence, did Mark pay in October?

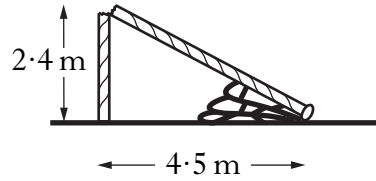
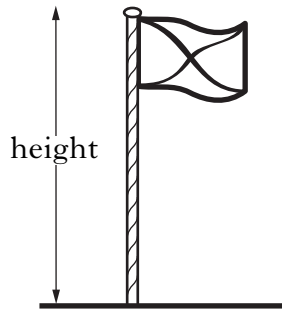
Exchange Rates

April £1 = €1.33
October £1 = €1.07

3

Marks

9. A flagpole snaps and falls over into the position shown.



Calculate the height of the flagpole before it fell over.

Do not use a scale drawing.

4

[Turn over

Marks

10. Joe borrows £1400 from a bank.
The rate of interest is 7.5% per annum.
Calculate the interest he must pay after four months.

3

Marks

11. Carol is a shop assistant.
Her employer is introducing new pay rates.
Carol's current and new pay rates are shown below.

Current Pay Rate		New Pay Rate	
Mon–Fri	£8 per hour	Mon–Sat	£8.75 per hour
Sat	time and a half		

Carol works 7 hours each day from **Tuesday to Saturday**.

Will she be better or worse off when the new pay rates are introduced **and** by how much?

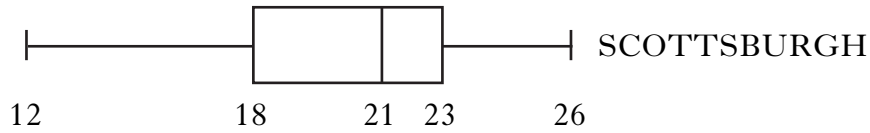
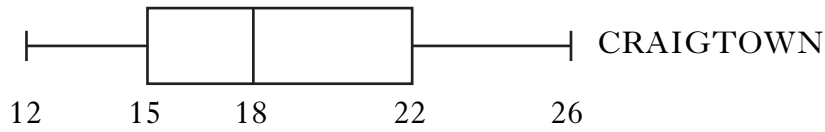
4

[Turn over

Marks

12. The temperatures (in °C) were recorded at noon each day in August at Craigtown and Scottsburgh.

The results are shown in the boxplots below.



- (a) Calculate the interquartile range of the temperatures in Craigtown.

2

- (b) Explain how you can tell from the boxplots that the statement below is true.

“On average, the temperatures in Scottsburgh are higher and they tend to be more consistent.”

2

Marks

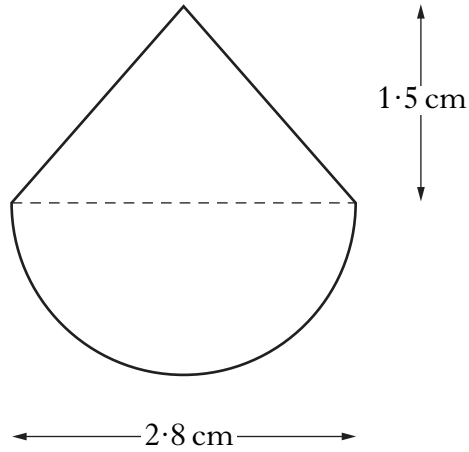
13. Alysoun bought a mobile phone for £125.
She sold it a few months later for £80.
Calculate her loss as a percentage of what she paid for the phone.

4

[Turn over for Question 14 on *Page sixteen*]

Marks

14. A badge showing a clown's head consists of a semi-circle and a triangle.



Calculate the area of the badge in square centimetres.

Give your answer correct to one decimal place.

5

[END OF QUESTION PAPER]



DO NOT
WRITE IN
THIS
MARGIN

ADDITIONAL SPACE FOR ANSWERS

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