

FOR OFFICIAL USE

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**X100/101**



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Total  
Mark

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NATIONAL  
QUALIFICATIONS  
2011

WEDNESDAY, 18 MAY  
1.00 PM – 1.35 PM

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

--

Surname

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Date of birth

Day      Month      Year

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Scottish candidate number

--	--	--	--	--	--	--	--	--	--

Number of seat

--

- 1 You may **NOT** use a calculator.
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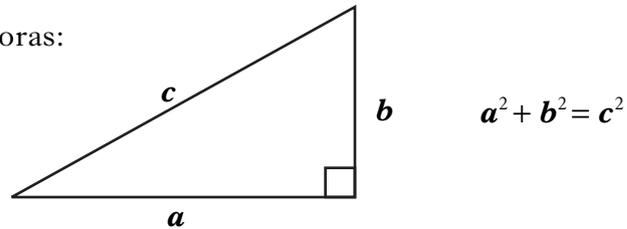
Use blue or black ink. Pencil may be used for graphs and diagrams only.



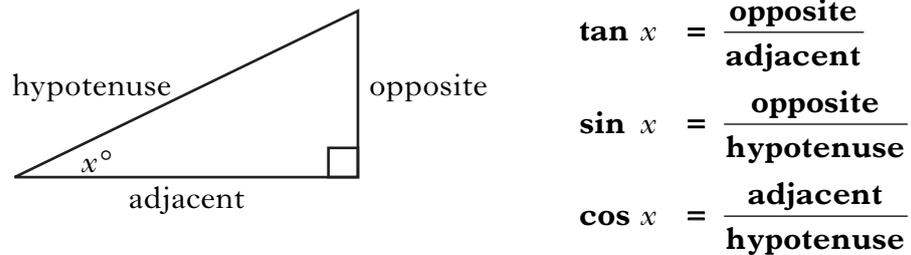
## FORMULAE LIST

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:



Marks

**ALL questions should be attempted.**

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

1

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

1

(c) Find  $12 \times 13$ .

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

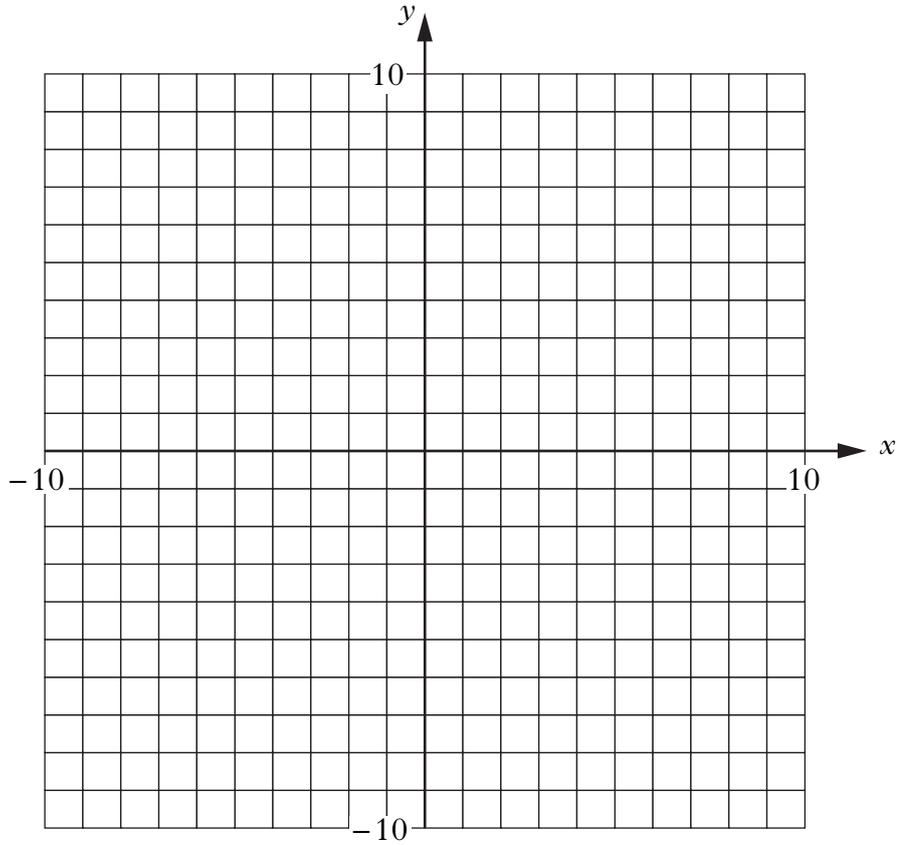
3. Work out the answer to

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

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. Solve algebraically the equation

$$7p - 2 = 54 + 3p.$$

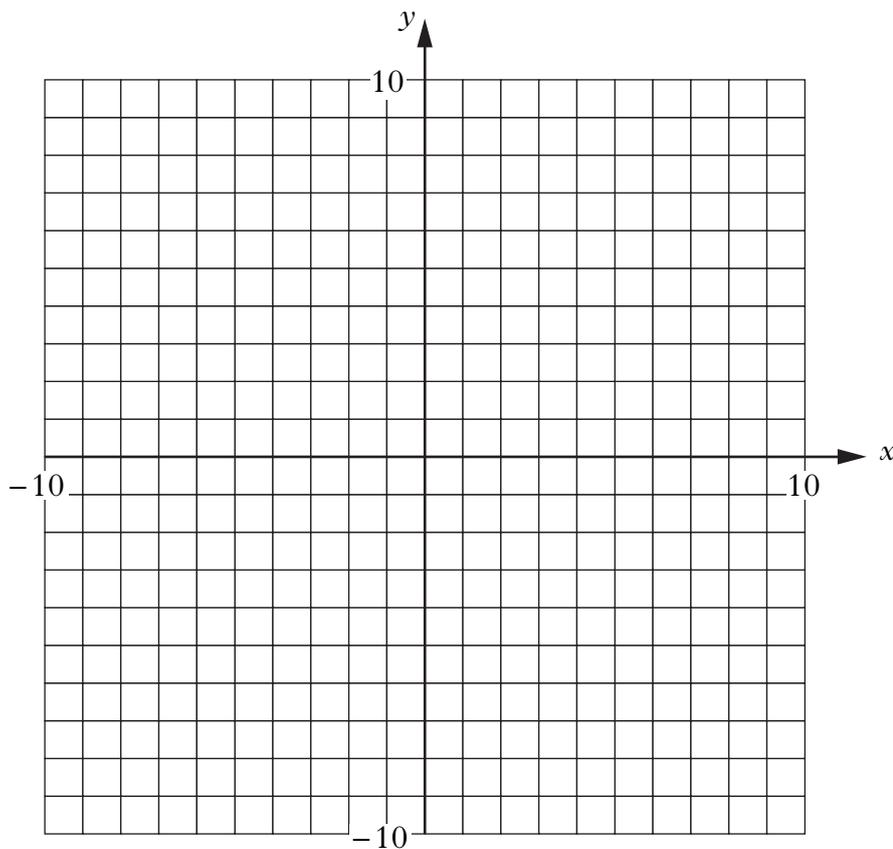
3

7. (a) Complete the table below for  $y = 3x - 2$ .

$x$	-2	0	3
$y$			

2

(b) Draw the line  $y = 3x - 2$  on the grid.



2

[Turn over

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

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

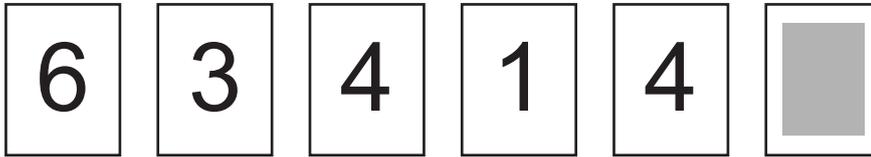
**[Turn over for Question 10 on Page ten**

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.



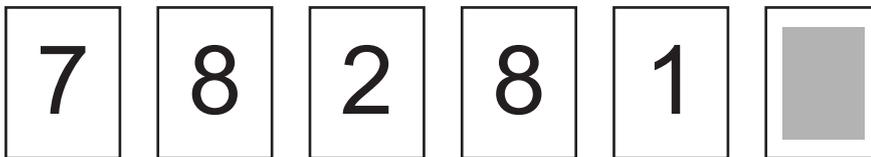
The range of the numbers on the **six** cards is 8.

Find the hidden number.

1

(b) 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]



DO NOT  
WRITE IN  
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**ADDITIONAL SPACE FOR ANSWERS**

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**ADDITIONAL SPACE FOR ANSWERS**

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**X100/103**



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

Total  
Mark

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NATIONAL  
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2011

WEDNESDAY, 18 MAY  
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**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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Scottish candidate number

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Number of seat

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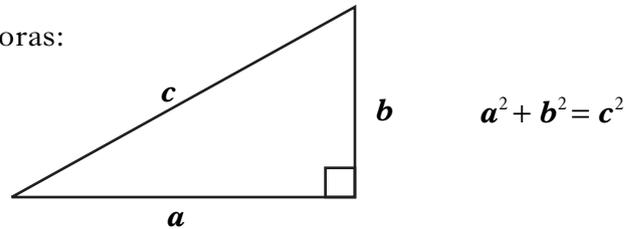
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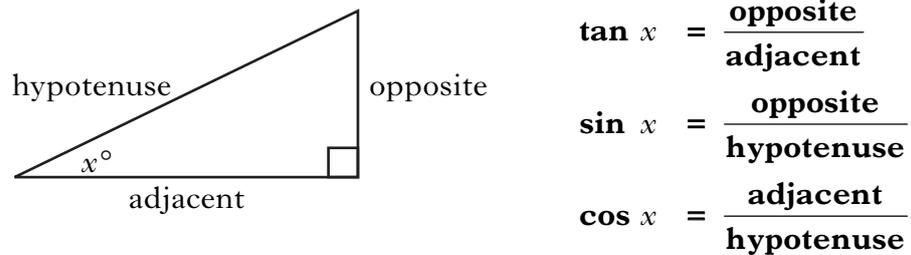
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Circumference of a circle:  $C = \pi d$   
Area of a circle:  $A = \pi r^2$

Theorem of Pythagoras:



Trigonometric ratios  
in a right angled  
triangle:



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. Solve algebraically the inequality

$$7c + 13 < 55.$$

2

**[Turn over**

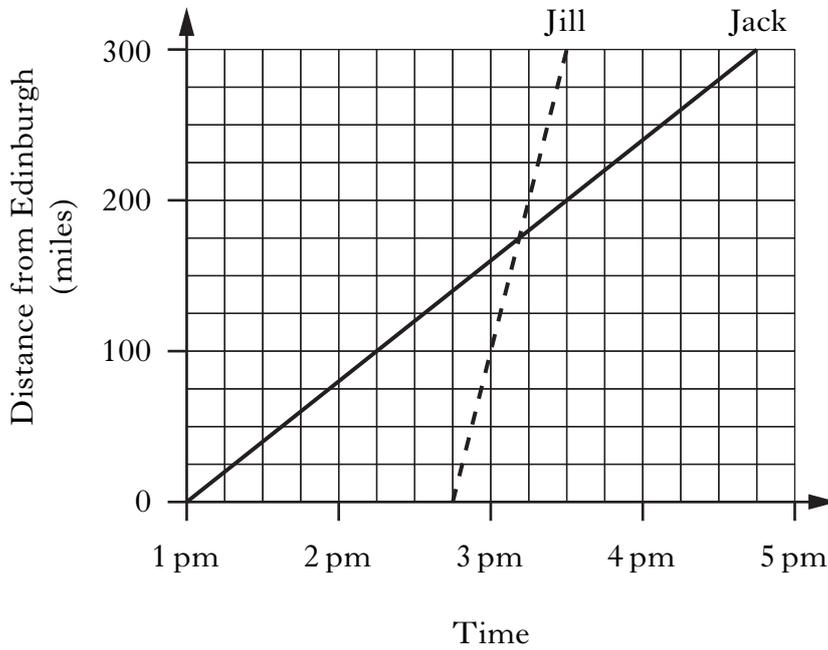
*Marks*

3. A factory produces 4000 widescreen televisions each valued at £950.  
Calculate the total value of the 4000 televisions.  
**Give your answer in standard form.**

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

[Turn over

*Marks*

5. (a) Multiply out the brackets and simplify

$$5(2m + 7) - m.$$

2

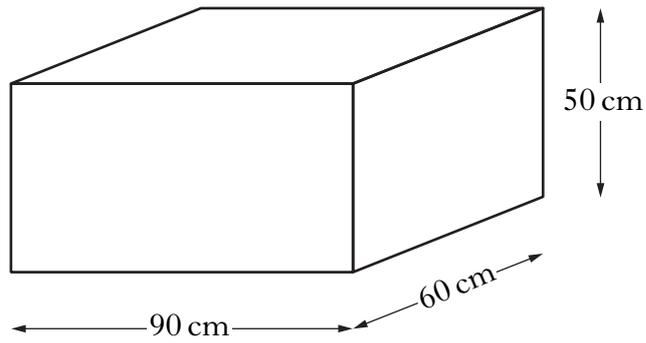
- (b) Factorise

$$24 - 18k.$$

2

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 cm<sup>3</sup>)

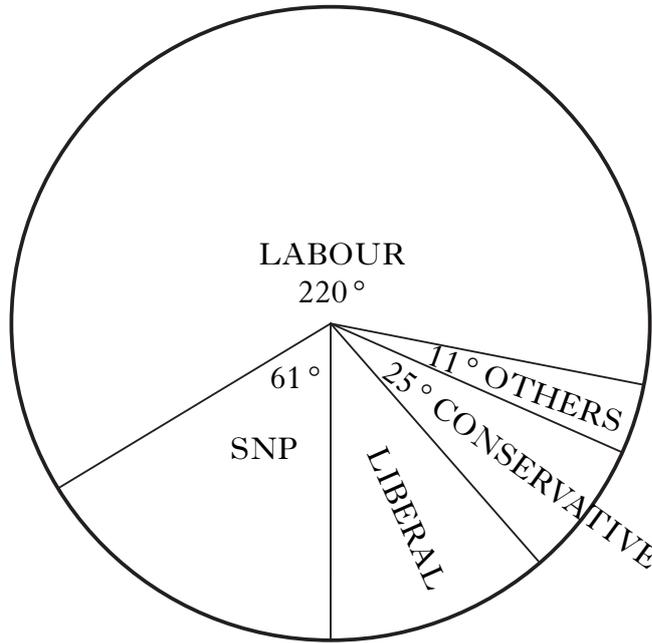
How long will it take to fill the tank?

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



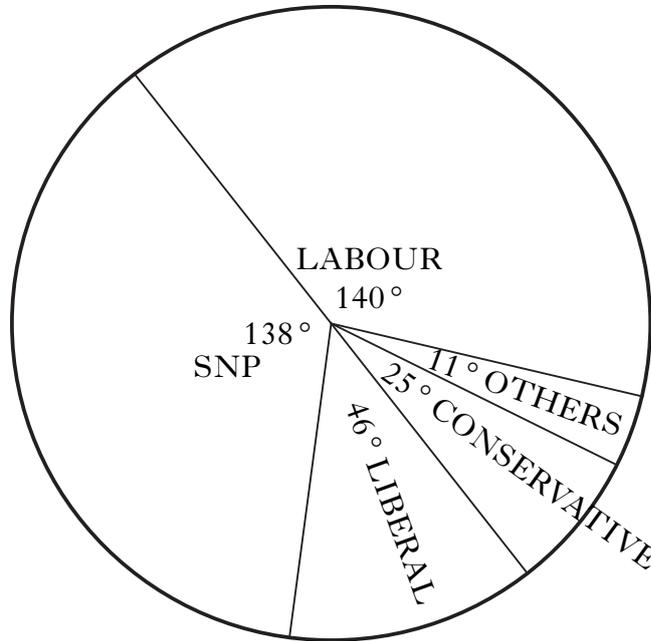
- (a) A total of 30 960 people voted in the Gleniston constituency. How many people voted for the Liberal candidate?

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?

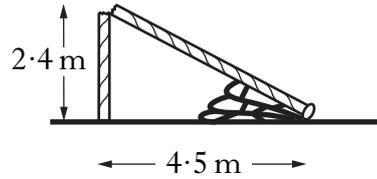
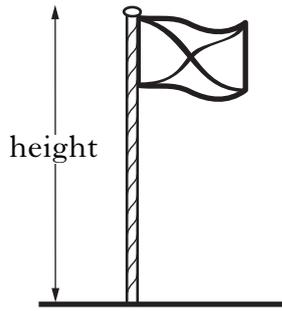
**Exchange Rates**

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

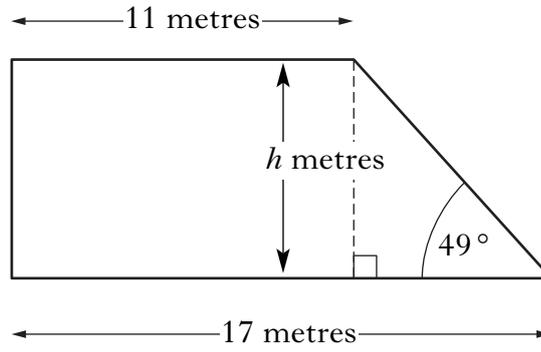
11. Use the formula below to find the value of  $P$  when  $m = 360$  and  $t = 0.45$ .

$$P = \sqrt{\frac{m}{2t}}$$

3

Marks

12. Calculate the height,  $h$  metres, of the trapezium shown below.  
**Do not use a scale drawing.**



4

[Turn over

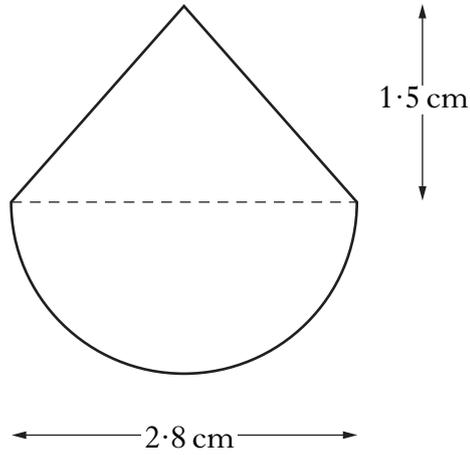
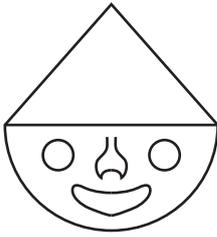
*Marks*

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

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]



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**X101/102**



\* X 1 0 1 1 0 0 1 1 \*

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**INTERMEDIATE 1**  
Units 1, 2 and  
Applications of Mathematics  
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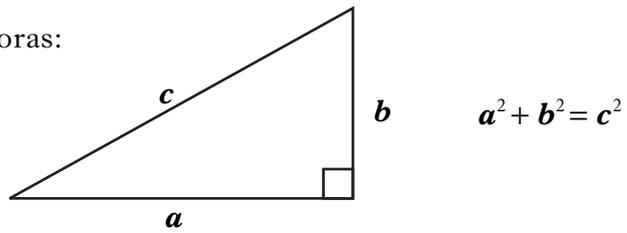
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Circumference of a circle:  $C = \pi d$   
Area of a circle:  $A = \pi r^2$   
Curved surface area of a cylinder:  $A = 2\pi r h$

Theorem of Pythagoras:



Marks

**ALL questions should be attempted.**

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

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

1

(c) Find  $12 \times 13$ .

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?

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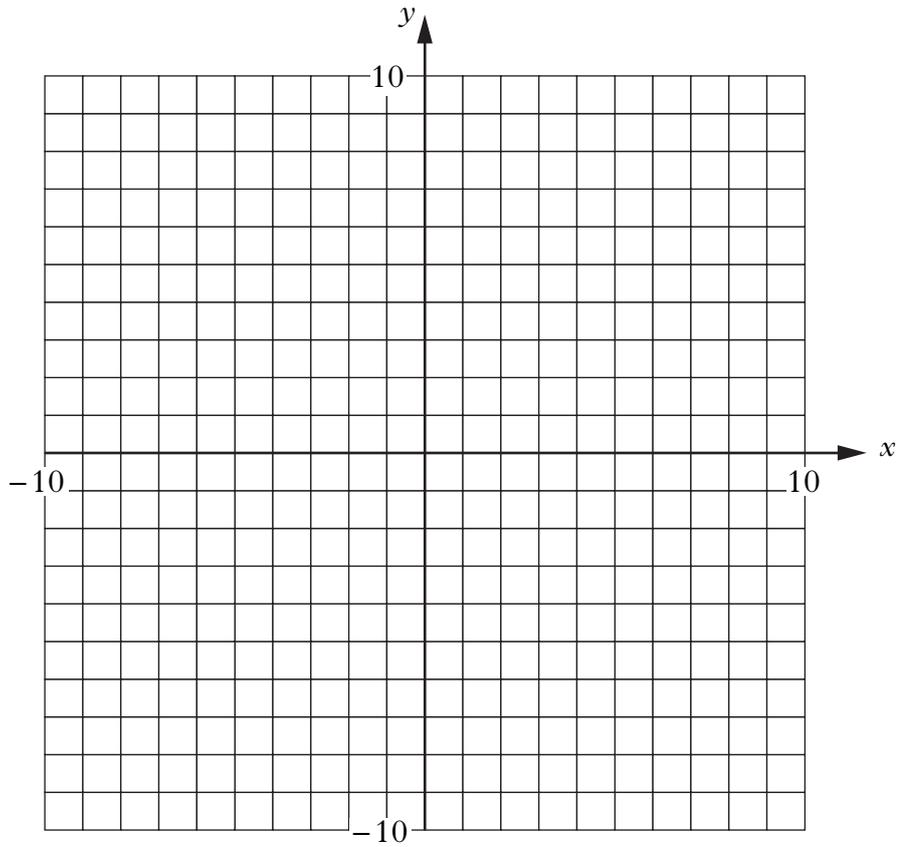
3. Work out the answer to

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

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

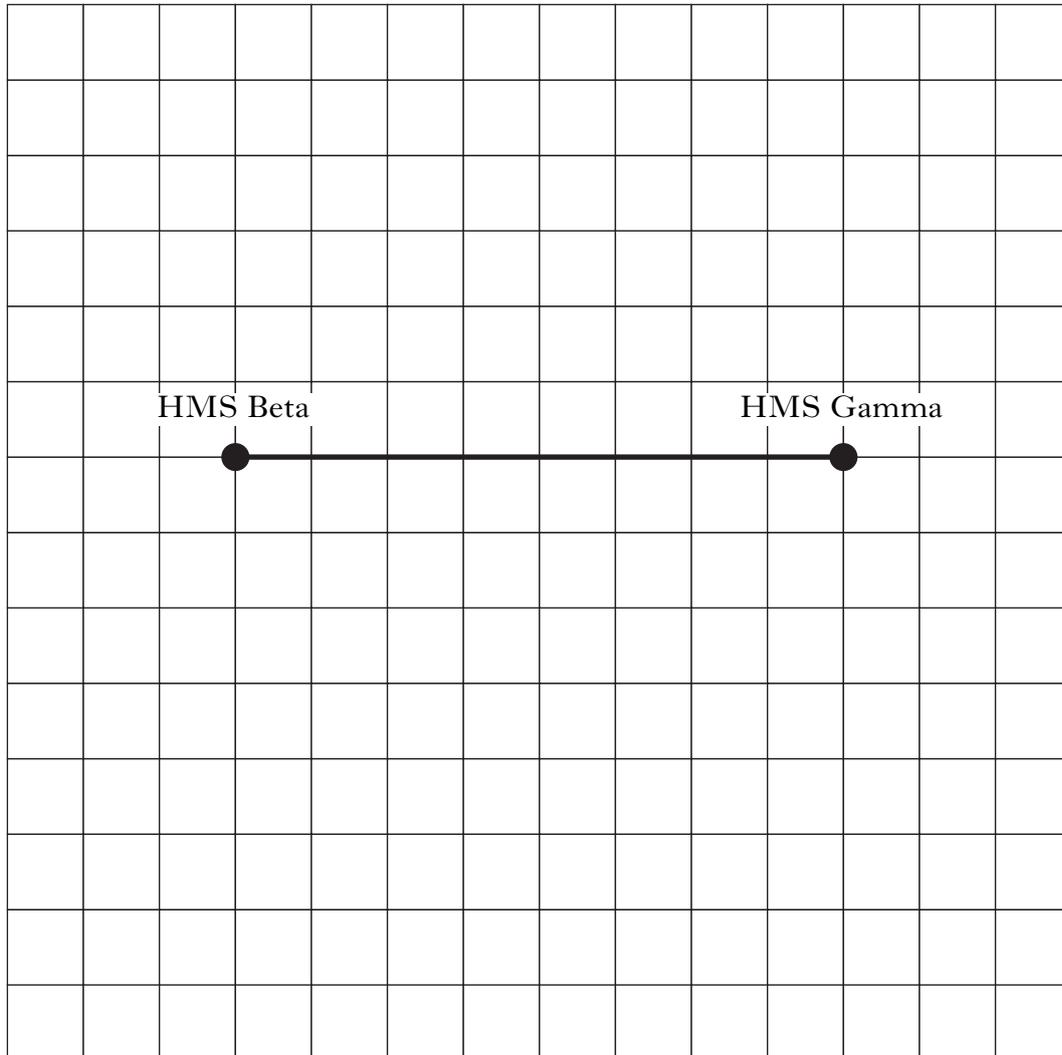
- (b) The average number of points is to be entered in cell E7. What formula should be used?

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
- $150^\circ$  from HMS Beta
  - $225^\circ$  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 (£)
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Complete the table to show **all** the possible combinations of items that Margaret can buy.

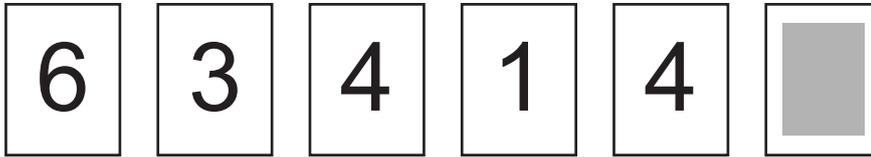
3

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.



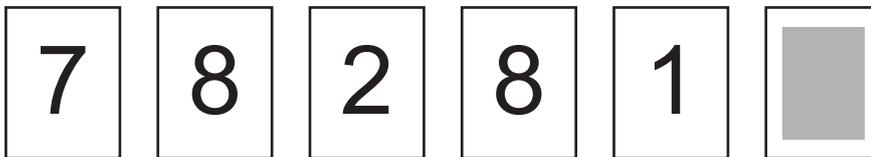
The range of the numbers on the **six** cards is 8.

Find the hidden number.

1

(b) 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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**X101/104**



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

Total  
Mark

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NATIONAL  
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2011

WEDNESDAY, 18 MAY  
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**MATHEMATICS**  
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Paper 2

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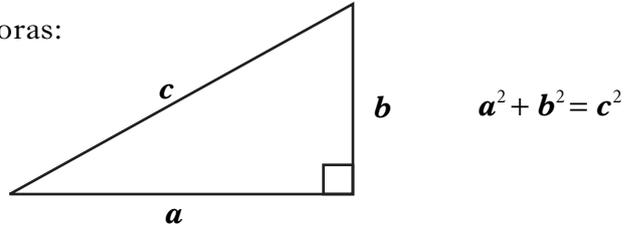
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Circumference of a circle:  $C = \pi d$   
Area of a circle:  $A = \pi r^2$   
Curved surface area of a cylinder:  $A = 2\pi r h$

Theorem of Pythagoras:



Marks

**ALL questions should be attempted.**

1. 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.

<b>Amount borrowed</b>	<b>6 months</b>	<b>12 months</b>	<b>18 months</b>	<b>24 months</b>	<b>30 months</b>
£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.

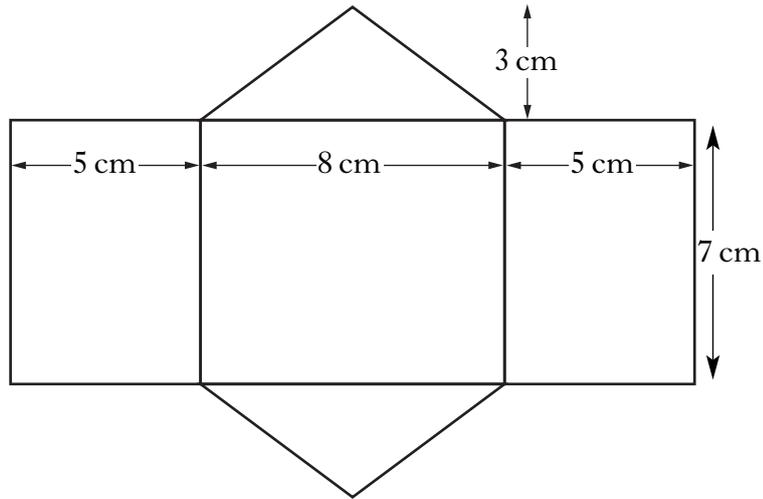
Calculate his **total** payments.

2

[Turn over

Marks

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

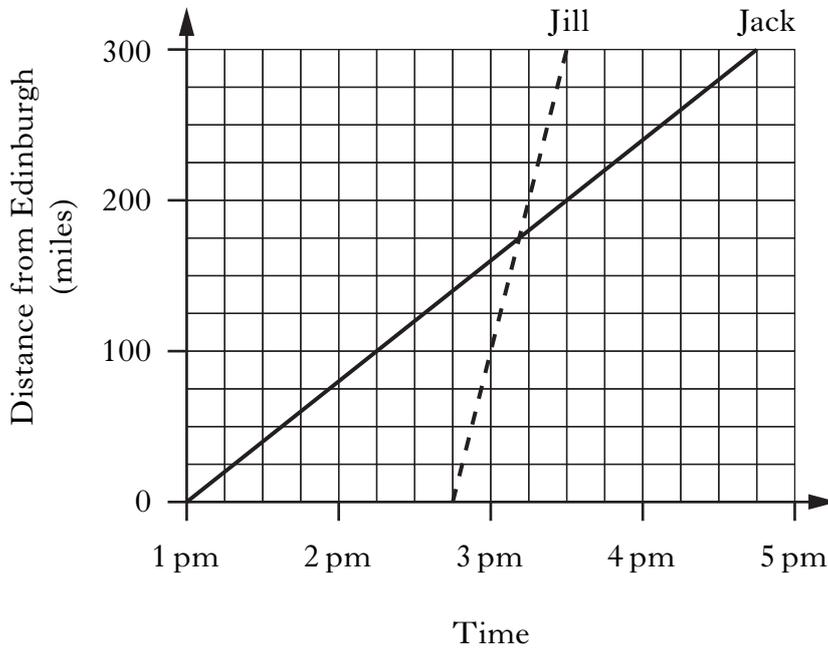


Find the total surface area of the triangular prism.

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

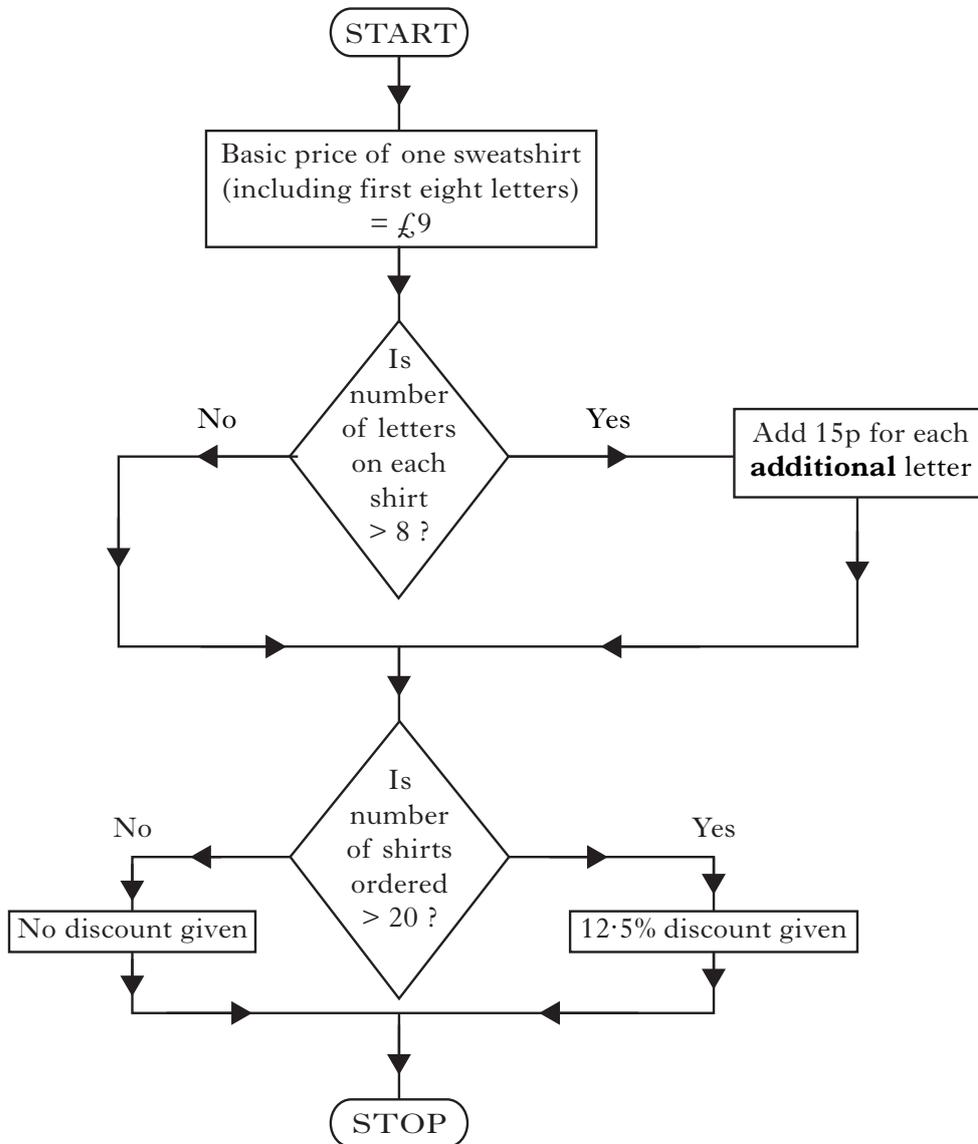
- (b) Calculate the average speed, in miles per hour, of Jack's journey.

3

Marks

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

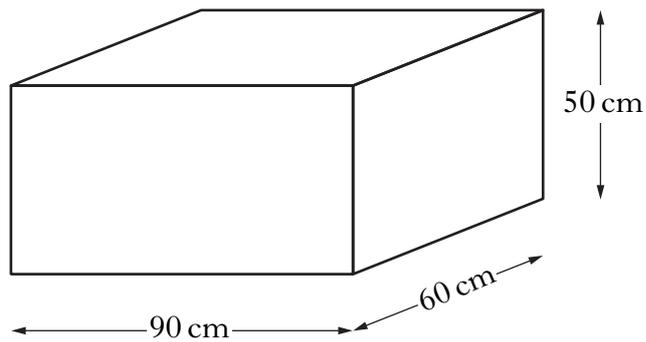
This flowchart is used to calculate the cost of the order.



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 cm<sup>3</sup>)

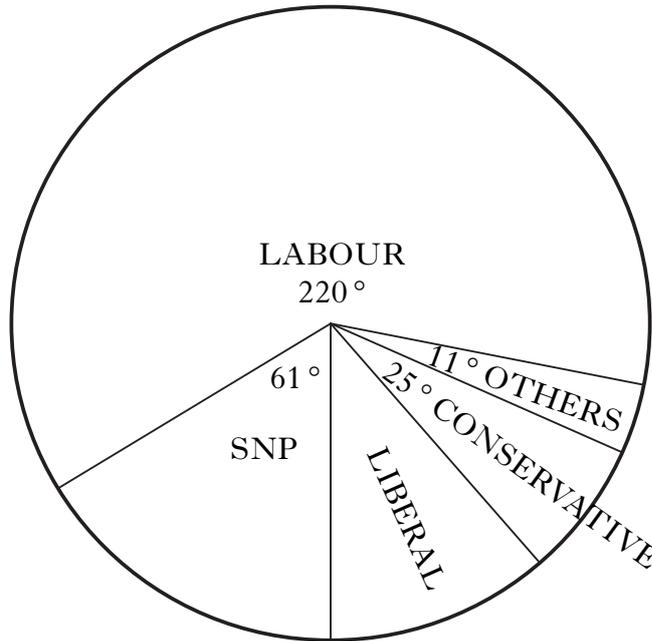
How long will it take to fill the tank?

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



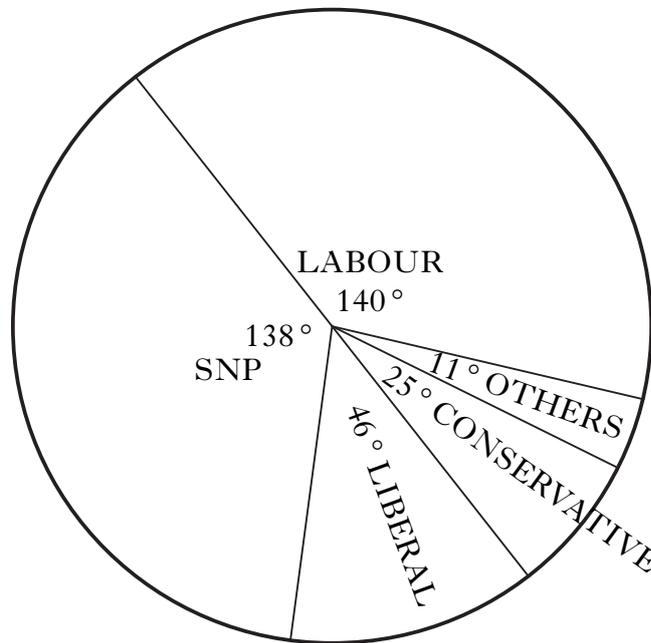
- (a) A total of 30 960 people voted in the Gleniston constituency. How many people voted for the Liberal candidate?

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?

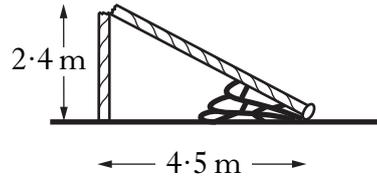
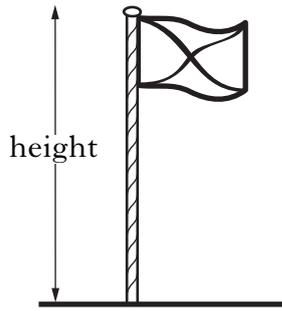
**Exchange Rates**

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 Sat time and a half	Mon–Sat £8.75 per hour

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?

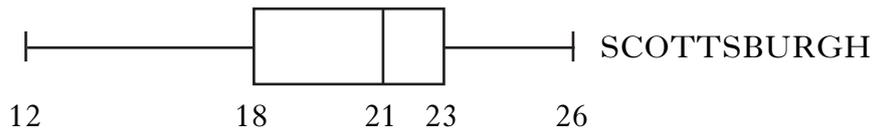
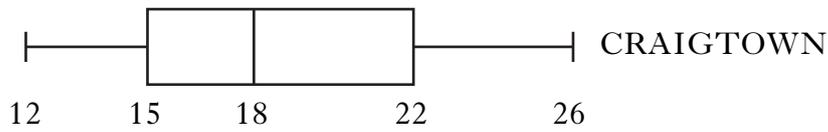
4

[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

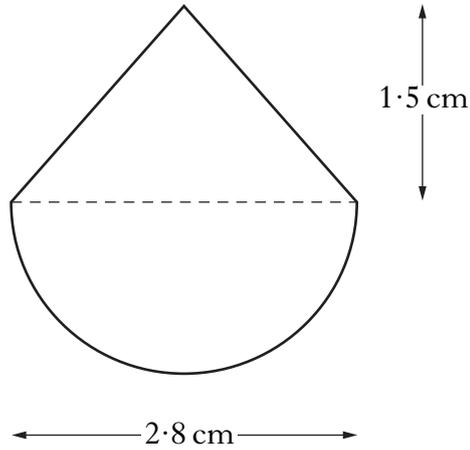
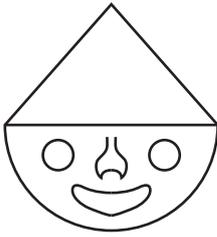
13. Alysoun bought a mobile phone for £125.  
She sold it a few months later for £80.  
Calculate her loss as a percentage of what she paid for the phone.

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]

**ADDITIONAL SPACE FOR ANSWERS**

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**ADDITIONAL SPACE FOR ANSWERS**

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DO NOT  
WRITE IN  
THIS  
MARGIN

**ADDITIONAL SPACE FOR ANSWERS**

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**ADDITIONAL SPACE FOR ANSWERS**

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2011 Mathematics  
Intermediate 1 Units 1, 2 & 3 Paper 2  
Finalised Marking Instructions

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Part One: General Marking Principles for Mathematics Intermediate 1 Units 1, 2 & 3  
Paper 2

*This information is provided to help you understand the general principles you must apply when marking candidate responses to questions in this Paper. These principles must be read in conjunction with the specific Marking Instructions for each question.*

1. Marks for each candidate response must always be assigned in line with these general marking principles and the specific Marking Instructions for the relevant question. If a specific candidate response does not seem to be covered by either the principles or detailed Marking Instructions, and you are uncertain how to assess it, you must seek guidance from the Principal Assessor. You can do this by posting a question on the Marking Team forum. Alternatively, you can refer the issue directly to the Principal Assessor by completing a Principal Assessor Referral form and returning it with the script in the normal way.
2. Marking should always be positive ie, marks should be awarded for what is correct and not deducted for errors or omissions.
3. Award one mark for each ‘bullet’ point shown in the Marking Instructions.
4. Working subsequent to an error must be followed through with the possibility of awarding all remaining marks for the subsequent working, provided the question has not been not simplified as a result of the error. In particular, the answer to one part of a question, even if incorrect, must be accepted as a basis for subsequent dependent parts of the question. Full marks in the dependent part(s) may be awarded provided the question has not been not simplified.
5. Solutions which seem unlikely to include anything of relevance must nevertheless be followed through. Candidates still have the opportunity of gaining one mark or more provided the solution satisfies the criteria for the marks.
6. The following should not be penalised:
  - working subsequent to a correct answer (unless it provides firm evidence that the requirements of the question have not been met)
  - omission or misuse of units (unless marks have been specifically allocated for the purpose in the Marking Instructions)
  - bad form, eg  $\sin x^\circ = 0.5 = 30^\circ$
  - legitimate variation in numerical values/algebraic expressions
7. Full credit should only be given where the solution contains appropriate working. Where the correct answer may be obtained by inspection or mentally, credit may be given, but reference to this will be made in the Marking Instructions.
8. In general only give credit for answers if working is shown. A wrong answer without working receives no credit unless specifically mentioned in the Marking Instructions. The rubric on page one of the question paper states that ‘full credit will be given only where the solution contains appropriate working’.
9. Sometimes the method to be used in a particular question is explicitly stated; no credit should be given where a candidate obtains the correct answer by an alternative method.
10. Where the method to be used in a particular question is not explicitly stated, full credit must be given for alternative methods which produce the correct answer.

11. Do not penalise the same error twice in the same question.
12. Do not penalise a transcription error unless the question has been simplified as a result.
13. Where a solution has been scored out and not replaced then provided the solution is legible marks should be awarded in line with the Marking Instructions for that question.
14. Where more than one solution is given, mark them all and award the least mark.
15. The symbols ✓ and ✕ are used in the Marking Instructions to give guidance regarding the awarding of marks for specific candidate responses to some questions, eg ‘award 2/4 ✓✕✕✓’ indicates that the 1<sup>st</sup> & 4<sup>th</sup> marks should be awarded but the 2<sup>nd</sup> & 3<sup>rd</sup> marks should not.

Part Two: Mathematics Intermediate 1: Paper 2, Units 1, 2 and 3

Question	Expected Answer/s	Max Mark	Additional Guidance
1	<p>Ans: 50 minutes</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> find number of calories per minute: <math>160 \div 20 = 8</math></li> <li>•<sup>2</sup> find time: <math>400 \div 8 = 50</math></li> </ul>	2	<p>1. Correct answer without working award 2/2</p> <p>2. Alternative strategies</p> <p>(a)</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> <math>20 \div 160 = 0.125</math></li> <li>•<sup>2</sup> <math>0.125 \times 400 = 50</math></li> </ul> <p>(b)</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> <math>400 \div 160 = 2.5</math></li> <li>•<sup>2</sup> <math>2.5 \times 20 = 50</math></li> </ul> <p>(c)</p> <ul style="list-style-type: none"> <li>•<sup>1,2</sup> eg <math>\begin{array}{r} 160 \ 20 \\ \underline{160 \ 20} \\ \phantom{160} \ 80 \ 10 \\ \underline{\phantom{160} \ 80 \ 10} \\ \phantom{160} \ 400 \ 50 \end{array}</math></li> </ul> <p>[In this case award 1/2 for correct strategy with one error.]</p>
2	<p>Ans: <math>c &lt; 6</math></p> <ul style="list-style-type: none"> <li>•<sup>1</sup> collect constants: <math>7c &lt; 42</math></li> <li>•<sup>2</sup> solve inequality for m: <math>c &lt; 6</math></li> </ul>	2	<p>1. For answers without valid working award 1/2 eg</p> <ul style="list-style-type: none"> <li>(a) <math>c &lt; 6</math> without working <math>\times \checkmark</math></li> <li>(b) <math>7 \times 6 + 13 &lt; 55 \rightarrow c &lt; 6 \times \checkmark</math></li> <li>(c) <math>7c = 42 \rightarrow c &lt; 6 \times \checkmark</math></li> </ul> <p>2. Answers acceptable for partial credit (valid working must be shown) award 1/2</p> <ul style="list-style-type: none"> <li>(a) <math>7c &lt; 42 \rightarrow c &lt; 6 \checkmark \times</math></li> <li>(b) <math>7c &lt; 42 \rightarrow c = 6 \checkmark \times</math></li> <li>(c) <math>7c = 42 \rightarrow c = 6 \checkmark \times</math></li> <li>(d) <math>7c &lt; 68 \rightarrow c &lt; 9.7(\dots) \times \checkmark</math></li> </ul>

Question	Expected Answer/s	Max Mark	Additional Guidance
3	<p>Ans: £ <math>3.8 \times 10^6</math></p> <ul style="list-style-type: none"> <li>•<sup>1</sup> find total value : <math>950 \times 4000 = 3\,800\,000</math></li> <li>•<sup>2</sup> express answer in standard form: <math>3.8 \times 10^n</math></li> <li>•<sup>3</sup> consistent power of ten: <math>3.8 \times 10^6</math></li> </ul>	3	<p>1. Correct answer without working award 3/3</p> <p>2. Some common answers (no working necessary)</p> <p>(a) <math>38 \times 10^5</math> award 2/3 ✓×✓</p> <p>(b) <math>3.8 \times 10^6</math> award 2/3 ✓✓×</p> <p>(c) <math>3 \times 10^6, 4 \times 10^6</math> award 2/3 ×✓✓</p> <p>(d) <math>9.5 \times 10^2, 4 \times 10^3</math> award 1/3</p>

Question		Expected Answer/s	Max Mark	Additional Guidance
4	a	<p>Ans: 1 hour 15 minutes</p> <ul style="list-style-type: none"> <li><sup>1</sup> interpret graph: 1 hour 15 minutes (or equivalent)</li> </ul>	1	
4	b	<p>Ans: 80 mph</p> <ul style="list-style-type: none"> <li><sup>1</sup> know how to find speed: <math>S = \frac{D}{T}</math></li> <li><sup>2</sup> interpret graph: <math>D = 300</math>, <math>T = 3\text{h}45\text{m}</math></li> <li><sup>3</sup> calculate speed: <math>300 \div 3.75 = 80</math></li> </ul>	3	<ol style="list-style-type: none"> <li>Correct answer without working award 3/3</li> <li>Some common answers (no working necessary, rounding or truncation is acceptable) <ul style="list-style-type: none"> <li>(a) <math>300 \div 3.45 = 87, 86(.9\dots)</math> award 2/3 ✓✓x</li> <li>(b) <math>300 \div 225 = 1.3(\dots)</math> award 2/3 ✓✓x</li> <li>(c) <math>300 \times 3.75 = 1125</math> award 2/3 x✓✓</li> <li>(d) <math>300 \times 3.45 = 1035</math> award 1/3 x✓x</li> <li>(e) <math>300 \times 225 = 67500</math> award 1/3 x✓x</li> </ul> </li> <li>Where time is only given in decimal form then 3<sup>rd</sup> mark is only available for division (or multiplication) by: 4.75 (Jack's arrival time), 3.5 (Jill's arrival time), 2.75 (Jill's departure time), 1.75 (difference of J&amp;J's starting times), 1.25 (answer to part a), 0.75 (Jill's journey time). <ul style="list-style-type: none"> <li>ie <math>300 \div 4.75 = 63</math> ✓x✓</li> <li><math>300 \times 0.75 = 225</math> xx✓</li> <li><math>300 \div 2.5 = 120</math> ✓xx</li> </ul>           However, 2h30 m leading to <math>300 \div 2.5 = 120</math>  <ul style="list-style-type: none"> <li>✓x✓</li> </ul> </li> <li>3<sup>rd</sup> mark is not available for division by a whole number.</li> </ol>

Question		Expected Answer/s	Max Mark	Additional Guidance
5	a	<p>Ans: <math>9m + 35</math></p> <ul style="list-style-type: none"> <li>•<sup>1</sup> multiply out bracket: <math>10m + 35</math></li> <li>•<sup>2</sup> collect like terms: <math>9m + 35</math></li> </ul>	2	<ol style="list-style-type: none"> <li>1. Correct answer without working award 2/2</li> <li>2. 2<sup>nd</sup> mark is not available if there is invalid subsequent working eg <math>9m + 35 \rightarrow 44m</math> award 1/2 <math>9m + 35 \rightarrow 35/9</math> award 1/2</li> <li>3. <math>10m + 35 - 5m = 5m + 35</math> <math>\times\checkmark</math> award 1/2</li> </ol>
5	b	<p>Ans: <math>6(4 - 3k)</math></p> <ul style="list-style-type: none"> <li>•<sup>1</sup> identify highest common factor: 6 or <math>4 - 3k</math></li> <li>•<sup>2</sup> factorise: <math>6(4 - 3k)</math></li> </ul>	2	<ol style="list-style-type: none"> <li>1. <math>2(12 - 9k), 3(8 - 6k)</math> award 1/2 <math>\times\checkmark</math></li> </ol>
6		<p>Ans: 18 minutes</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> know how to find volume of tank: <math>90 \times 60 \times 50</math></li> <li>•<sup>2</sup> know how to find volume in litres: <math>(90 \times 60 \times 50) \div 1000</math></li> <li>•<sup>3</sup> know how to find time: <math>[(90 \times 60 \times 50) \div 1000] \div 15</math></li> <li>•<sup>4</sup> calculate <math>[(\text{volume}) \div 1000] \div 15 = 18</math></li> </ul>	4	<ol style="list-style-type: none"> <li>1. Correct answer with no working award 4/4</li> <li>2. Some common answers (working must be shown) <ul style="list-style-type: none"> <li>(a) <math>270000 \div 15 \div 60 = 300</math> <math>\checkmark \times \checkmark \times</math> award 2/4</li> <li>(b) <math>270000 \div 1000 \div 60 = 4.5</math> <math>\checkmark \checkmark \times \times</math> award 2/4</li> <li>(c) <math>[(90 + 60 + 50) \div 1000] \div 15 = 0.013</math> <math>\times \checkmark \checkmark \checkmark</math> award 3/4</li> </ul> </li> </ol>

Question		Expected Answer/s	Max Mark	Additional Guidance
7	a	<p>Ans: 3698</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> find 'Liberal' angle: 43</li> <li>•<sup>2</sup> know how to find number of Liberal votes:  <math>\frac{43}{360} \times 30960</math>  or  <math>\frac{30960}{360} \times 43</math>  or  <math>43 \div (360 \div 30960)</math></li> <li>•<sup>3</sup> find number of Liberal votes: 3698</li> </ul>	3	<ol style="list-style-type: none"> <li>1. Correct answer without working award 3/3</li> <li>2. 27262 [<math>\frac{317}{360} \times 30960</math>] award 2/3 <math>\times\check{\check{}}</math> (no working necessary)</li> <li>3. A common answer (working must be shown) 43% of 30960 = 13312(-8), 13313 award 1/3 <math>\check{\times}\times</math></li> <li>4. Do not award third mark where premature rounding results in wrong answer eg <math>\frac{43}{360} \times 30960 = 0.12 \times 30960 = 3715(-2)</math> award 2/3 <math>\check{\check{}}\times</math></li> </ol>
7	b	<p>Ans: In the by-election more voted SNP fewer voted Labour more voted Liberal</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> state any one of the above differences</li> <li>•<sup>2</sup> state another one of the above differences</li> </ul>	2	<ol style="list-style-type: none"> <li>1. Disregard invalid statements. eg SNP increased <math>\checkmark</math> Labour decreased <math>\checkmark</math> Liberal decreased <math>\times</math> award 2/2</li> <li>2. Disregard incorrect numerical references. eg SNP gained 70° Labour lost 90° award 2/2</li> <li>3. Some common answers (a) Labour lost votes to SNP award 2/2 (b) In 2005 Labour had much more than SNP, but in 2008 they were close to each other. award 1/2</li> </ol>



Question	Expected Answer/s	Max Mark	Additional Guidance
10	<p>Ans: £35</p> <p>•<sup>1</sup>•<sup>2</sup> know how to calculate interest:  <math>\frac{7.5}{100} \times 1400 \times \frac{4}{12}</math>            (award 1 for <math>\frac{7.5}{100} \times 1400</math>            or <math>\frac{4}{12} \times \frac{7.5}{100}</math>            or <math>\frac{4}{12} \times 1400</math>)</p> <p>•<sup>3</sup> carry out percentage and fraction calculations correctly: 35</p>	3	<p>1. Correct answer without working award 3/3</p> <p>2. If answer is 1435 [1400 + 35] (no working necessary)            (a) award 3/3 if candidate states that interest is 35            (b) award 2/3 if candidate does not state that interest is 35</p> <p>3. Acceptable answers for partial credit (no working necessary)            (a) 105 [7.5% of 1400] award 1/3            (b) 2.5 [<math>\frac{4}{12} \times 7.5</math>] award 1/3            (c) 466.67 or 466.66 [<math>\frac{4}{12} \times 1400</math>] award 1/3            (d) 420 [105 × 4] award 1/3</p> <p>4. The following common wrong answers illustrate where the 3<sup>rd</sup> mark is available to candidates, working must be shown.            (a) <math>1400 \times \frac{100}{7.5} \times \frac{4}{12} = 6222.22</math> × ✓✓ (note: answer must be rounded or truncated to nearest penny)            (b) <math>1400 \div 7.5 \times \frac{4}{12} = 62.22</math> × ✓×            (c) <math>1400 \times \frac{7.5}{100} \times \frac{12}{4} = 315</math> ✓×✓            (d) <math>1400 \times 0.75 \times \frac{12}{4} = 3150</math> ××✓</p>

Question	Expected Answer/s	Max Mark	Additional Guidance
11	<p>Ans: 20</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> multiply correctly: <math>2 \times 0.45 = 0.9</math></li> <li>•<sup>2</sup> divide correctly: <math>360 \div 0.9 = 400</math></li> <li>•<sup>3</sup> find square root correctly: <math>\sqrt{400} = 20</math></li> </ul>	3	<ol style="list-style-type: none"> <li>1. Correct answer without working award 3/3</li> <li>2. Some common answers (no working necessary) <ul style="list-style-type: none"> <li>(a) <math>\sqrt{(360/2 \times 0.45)} = 9</math> award 2/3 x✓✓</li> <li>(b) <math>\sqrt{360/0.9} = 21.081\dots</math> award 2/3 ✓✓x</li> <li>(c) <math>\sqrt{360/2 \times 0.45} = 4.269\dots</math> award 1/3 x✓x</li> </ul> </li> <li>3. Some common answers where working must be shown <ul style="list-style-type: none"> <li>(a) <math>\sqrt{(360 \times 2 \times 0.45)} = 18</math> award 2/3 ✓x✓</li> <li>(b) <math>\sqrt{(360) \times 2 \times 0.45} = 17.076\dots</math> award 1/3 ✓xx</li> <li>(c) <math>\sqrt{(360 \div 0.45^2)} = 42.16\dots</math> award 2/3 x✓✓</li> <li>(d) <math>\sqrt{(360) \div 0.45} = 42.16\dots</math> award 1/3 x✓x</li> <li>(e) <math>\sqrt{(360 \div 0.45)} = 28.28\dots</math> award 2/3 x✓✓</li> <li>(f) <math>\sqrt{(360 \div 2.45)} = 12.12\dots</math> award 2/3 x✓✓</li> </ul> </li> <li>4. Accept answer rounded or truncated to 1 or more decimal places</li> </ol>

Question	Expected Answer/s	Max Mark	Additional Guidance
12	<p>Ans: 6.9 m (or 7m)</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> find base of triangle: <math>17 - 11 = 6</math></li> <li>•<sup>2</sup> use correct tan ratio: <math>\tan 49^\circ = \frac{h}{6}</math></li> <li>•<sup>3</sup> know how to solve equation: <math>h = 6 \times \tan 49^\circ</math></li> <li>•<sup>4</sup> carry out trig. calculation: <math>6.9(0....)</math></li> </ul>	4	<ol style="list-style-type: none"> <li>1. Correct answer without working award 3/4 Be aware <math>\tan 49 = \frac{h}{6}</math> <math>\tan^{-1}(6/49) = 6.9(8...)</math> ✓✓×✓</li> <li>2. Do not penalise inadvertent use of radians or grads -19(0...) (radians used) award 4/4 5(184...) (grads used) award 4/4</li> <li>3. Where an incorrect trig ratio is used, working should be followed through with the possibility of awarding 3/4. <ul style="list-style-type: none"> <li>(a) <math>6 \times \cos 49^\circ = 3.9(36...)</math> award 3/4 ✓×✓✓</li> <li>(b) <math>6 \times \sin 49^\circ = 4.5(28...)</math> award 3/4 ✓×✓✓</li> </ul> </li> <li>4. In awarding the 4<sup>th</sup> mark, the trig. ratio should not be rounded to any less than 2 decimal places eg <ul style="list-style-type: none"> <li>(a) <math>6 \times \tan 49^\circ = 6 \times 1.15 = 6.9</math> award 4/4</li> <li>(b) <math>6 \times \tan 49^\circ = 6 \times 1.2 = 7.2</math> award 3/4 ✓✓✓×</li> </ul> </li> </ol>

Question	Expected Answer/s	Max Mark	Additional Guidance
13	<p>Ans: 36% (See Note 1)</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> find loss: 45</li> <li>•<sup>2</sup> know to express loss as a fraction of 125: <math>\frac{45}{125}</math></li> <li>•<sup>3</sup> know to multiply fraction by 100: <math>\frac{45}{125} \times 100</math></li> <li>•<sup>4</sup> carry out all calculations correctly: 36</li> </ul>	4	<p>1. Correct answer without working award 2/4</p> <p><b>Be aware <math>\frac{45}{100} \times 80 = 36</math> award 2/4 ✓××✓</b></p> <p>When the only working is 45 and 36 award 2/4 ✓××✓</p> <p>2. 4<sup>th</sup> mark is only available for calculations of the form <math>\frac{a}{b} \times c</math> where a,b,c = calculated loss or 125 or 80 or 100.</p> <p>3. Some common answers (working must be shown)</p> <p>(a) (i) <math>56(.25) [\frac{45}{80} \times 100]</math> award 3/4 ✓××✓✓</p> <p>(ii) <math>56(.25) [\frac{45}{100} \times 125]</math> award 2/4 ✓××✓</p> <p>When the only working is 45 and 56(.25) award 2/4 ✓××✓</p> <p>(b) <math>64 [\frac{80}{125} \times 100]</math> award 3/4 ×✓✓✓</p> <p>(c) 178, 177(.7...) <math>[\frac{80}{45} \times 100]</math> award 3/4 ✓×✓✓</p> <p>(d) <math>156(.25) [\frac{125}{80} \times 100]</math> award 2/4 ××✓✓</p> <p>(e) <math>100 [\frac{80}{100} \times 125</math> or <math>\frac{125}{100} \times 80]</math> award 1/4 ×××✓</p>

Question	Expected Answer/s	Max Mark	Additional Guidance
14	<p>Ans: 5.2 cm<sup>2</sup></p> <ul style="list-style-type: none"> <li>•<sup>1</sup> know to calculate area of semi-circle: <math>\frac{1}{2} \pi r^2</math></li> <li>•<sup>2</sup> substitute correct radius into formula: <math>\frac{1}{2} \times \pi \times 1.4^2</math></li> <li>•<sup>3</sup> know to add area of triangle to area of semi-circle: <math>\frac{1}{2} \times \pi \times 1.4^2 + \frac{1}{2} \times 2.8 \times 1.5</math></li> <li>•<sup>4</sup> carry out all calculations correctly: <math>3.07\dots + 2.1 = 5.17\dots</math> (must include a circle calculation followed by an addition)</li> <li>•<sup>5</sup> round to one decimal place: 5.2</li> </ul>	5	<ol style="list-style-type: none"> <li>1. Correct answer without working award 0/5</li> <li>2. Some common answers (working must be shown) <ul style="list-style-type: none"> <li>(a) 8.3 [<math>\pi \times 1.4^2 + \frac{1}{2} \times 2.8 \times 1.5</math>] award 4/5 <math>\times \checkmark \checkmark \checkmark \checkmark</math></li> <li>(b) 7.3 [<math>\frac{1}{2} \times \pi \times 1.4^2 + 2.8 \times 1.5</math>] award 4/5 <math>\checkmark \times \checkmark \checkmark \checkmark</math></li> <li>(c) 14.4 [<math>\frac{1}{2} \times \pi \times 2.8^2 + \frac{1}{2} \times 2.8 \times 1.5</math>] award 4/5 <math>\checkmark \times \checkmark \checkmark \checkmark</math></li> <li>(d) 6.5 [<math>\frac{1}{2} \times \pi \times 2.8 + \frac{1}{2} \times 2.8 \times 1.5</math>] award 4/5 <math>\times \checkmark \checkmark \checkmark \checkmark</math></li> <li>(e) 4.3 [<math>\frac{1}{2} \times \pi \times 1.4 + \frac{1}{2} \times 2.8 \times 1.5</math>] award 3/5 <math>\times \times \checkmark \checkmark \checkmark</math></li> <li>(f) 3.1 [<math>\frac{1}{2} \times \pi \times 1.4^2</math>] award 3/5 <math>\checkmark \checkmark \times \times \checkmark</math></li> <li>(g) 6.2 [<math>\pi \times 1.4^2</math>] award 2/5 <math>\times \checkmark \times \times \checkmark</math></li> <li>(h) 4.4 [<math>\frac{1}{2} \times \pi \times 2.8</math>] award 2/5 <math>\times \checkmark \times \times \checkmark</math></li> <li>(i) 8.8 [<math>\pi \times 2.8</math>] award 2/5 <math>\times \checkmark \times \times \checkmark</math></li> <li>(j) 2.2 [<math>\frac{1}{2} \times \pi \times 1.4</math>] award 1/5 <math>\times \times \times \times \checkmark</math></li> </ul> </li> <li>3. (a) 5<sup>th</sup> mark is only available where the final answer or answer to circle calculation requires rounding. (b) Where premature rounding leads to incorrect answer, a maximum of 4/5 is available eg triangle = <math>(\frac{1}{2} \times 1.4 \times 1.5) \times 2</math> = <math>1.05 \times 2</math> = <math>1.1 \times 2</math> total area = <math>2.2 + 3.1 = 5.3</math></li> </ol>

TOTAL MARKS FOR PAPER 2  
50

TOTAL MARKS FOR  
PAPER 1 & 2  
80

[END OF MARKING INSTRUCTIONS]



# 2011 Mathematics

## Intermediate 1 Units 1, 2 & 3 Paper 1

### Finalised Marking Instructions

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Part One: General Marking Principles for Mathematics Intermediate 1 Units 1, 2 & 3  
Paper 1

*This information is provided to help you understand the general principles you must apply when marking candidate responses to questions in this Paper. These principles must be read in conjunction with the specific Marking Instructions for each question.*

1. Marks for each candidate response must always be assigned in line with these general marking principles and the specific Marking Instructions for the relevant question. If a specific candidate response does not seem to be covered by either the principles or detailed Marking Instructions, and you are uncertain how to assess it, you must seek guidance from the Principal Assessor. You can do this by posting a question on the Marking Team forum. Alternatively, you can refer the issue directly to the Principal Assessor by completing a Principal Assessor Referral form and returning it with the script in the normal way.
2. Marking should always be positive ie, marks should be awarded for what is correct and not deducted for errors or omissions.
3. Award one mark for each 'bullet' point shown in the Marking Instructions.
4. Working subsequent to an error must be followed through with the possibility of awarding all remaining marks for the subsequent working, provided the question has not been not simplified as a result of the error. In particular, the answer to one part of a question, even if incorrect, must be accepted as a basis for subsequent dependent parts of the question. Full marks in the dependent part(s) may be awarded provided the question has not been not simplified.
5. Solutions which seem unlikely to include anything of relevance must nevertheless be followed through. Candidates still have the opportunity of gaining one mark or more provided the solution satisfies the criteria for the marks.
6. The following should not be penalised:
  - working subsequent to a correct answer (unless it provides firm evidence that the requirements of the question have not been met)
  - omission or misuse of units (unless marks have been specifically allocated for the purpose in the Marking Instructions)
  - bad form, eg  $\sin x^\circ = 0.5 = 30^\circ$
  - legitimate variation in numerical values/algebraic expressions.
7. Full credit should only be given where the solution contains appropriate working. Where the correct answer may be obtained by inspection or mentally, credit may be given, but reference to this will be made in the Marking Instructions.
8. In general only give credit for answers if working is shown. A wrong answer without working receives no credit unless specifically mentioned in the Marking Instructions. The rubric on page one of the question paper states that 'full credit will be given only where the solution contains appropriate working'.
9. Sometimes the method to be used in a particular question is explicitly stated; no credit should be given where a candidate obtains the correct answer by an alternative method.
10. Where the method to be used in a particular question is not explicitly stated, full credit must be given for alternative methods which produce the correct answer.

11. Do not penalise the same error twice in the same question.
12. Do not penalise a transcription error unless the question has been simplified as a result.
13. Where a solution has been scored out and not replaced then provided the solution is legible marks should be awarded in line with the Marking Instructions for that question.
14. Where more than one solution is given, mark them all and award the least mark.
15. The symbols ✓ and ✗ are used in the Marking Instructions to give guidance regarding the awarding of marks for specific candidate responses to some questions, eg 'award 2/4 ✓✗✓' indicates that the 1<sup>st</sup> & 4<sup>th</sup> marks should be awarded but the 2<sup>nd</sup> & 3<sup>rd</sup> marks should not.

Part Two: Mathematics Intermediate 1: Paper 1, Units 1, 2 and 3

Question		Expected Answer/s	Max Mark	Additional Guidance
1	a	<p>Ans: 20.37</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> calculate <math>6.47 + 13.9</math>: 20.37</li> </ul>	1	
1	b	<p>Ans: 225</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> calculate <math>\frac{5}{8}</math> of 360: 225</li> </ul>	1	
1	c	<p>Ans: 156</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> calculate <math>12 \times 13</math>: 156</li> </ul>	1	
2		<p>Ans: 13 hours 35 minutes</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> calculate time from 1745 to 0720: 13 hours 35 minutes</li> </ul>	1	1. Accept 13.35
3		<p>Ans: 25</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> know to multiply <math>4 \times (-2)</math> then subtract answer from 17: eg <math>17 - (-8)</math>, <math>17 + 8</math></li> <li>•<sup>2</sup> carry out integer multiplication and subtraction correctly: 25</li> </ul>	2	<p>1. Some common answers (no working necessary)</p> <p>(a) 25 award 2/2</p> <p>(b) -26 [<math>13 \times (-2)</math>] award 1/2</p> <p>(c) 8 or -8 award 0/2</p> <p>2. Some common answers (working must be shown)</p> <p>(a) <math>17 - 8 = 9</math> or <math>17 - 8</math> award 1/2</p> <p>(b) <math>-8 - 17 = -25</math> [<math>4 \times (-2) - 17</math>] award 1/2</p> <p>(c) <math>8 - 17 = -9</math> [<math>4 \times (-2) - 17</math>] award 0/2</p> <p>(d) <math>17 - 6 = 11</math> award 0/2</p> <p>(e) <math>17 + 6 = 23</math> award 0/2</p>

Question		Expected Answer/s	Max Mark	Additional Guidance
4	a	<p>Ans: (-7,2) and (5,-6) plotted correctly</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> (-7,2) and (5,-6) plotted correctly:</li> </ul>	1	<ol style="list-style-type: none"> <li>1. Points need not be labelled</li> </ol>
4	b	<p>Ans: (-1,-2)</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> state coordinates of midpoint of PQ: (-1,-2)</li> </ul>	1	<ol style="list-style-type: none"> <li>1. Line PQ need not be drawn</li> <li>2. Accept -1,-2 without brackets or (-1), (-2)</li> <li>3. Where (2,-7) and (-6,5) are plotted in (a) then accept either (-2,-1) or (-1,-2) in (b)</li> </ol>

Question		Expected Answer/s	Max Mark	Additional Guidance
5	a	<p>Ans: £4</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> know how to find cost of additional distance: <math>2 \times 50(p)</math></li> <li>•<sup>2</sup> correctly add £3 to above: <math>(£)3 + 2 \times 50(p) = (£)4</math></li> </ul>	2	<p>1. (£)4 without working award 2/2</p> <p>2. Some common answers (working must be shown)</p> <p>(a) <math>3 \times (£)3 + 2 \times 50(p) = (£)10</math> award 1/2</p> <p>(b) <math>(£)3 + 3 \times 50(p) = (£)4.50</math> award 1/2</p> <p>(c) <math>3 \times (£)3 + 3 \times 50(p) = (£)10.50</math> award 0/2</p> <p>(d) <math>(£)3 + 50(p) = (£)3.50</math> award 0/2</p>
5	b	<p>Ans: 4500m</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> know to split £7 into £3 + <math>8 \times 50p</math></li> <li>•<sup>2</sup> calculate distance: <math>500 + 8 \times 500 = 4500</math></li> </ul>	2	<p>1. 4500 without working award 2/2 (irrespective of answer to (a))</p> <p>2. Award 1/2 for these common answers (working must be shown)</p> <p>(a) If candidate uses 50p per 500m, then allow one 500 less or one 500 extra</p> <p>(i) <math>8 \times 500 = 4000</math></p> <p>(ii) <math>500 + 7 \times 500 = 4000</math></p> <p>(iii) <math>500 + 9 \times 500 = 5000</math></p> <p>(b) If candidate uses £1 per 1000m, then allow one 1000 less or one 1000 extra</p> <p>(i) <math>4 \times 1000 = 4000</math></p> <p>(ii) <math>500 + 3 \times 1000 = 3500</math></p> <p>(iii) <math>500 + 5 \times 1000 = 5500</math></p> <p>(c) If candidate uses £1 per 500m, then £3 + <math>4 \times £1</math> must be used <math>500 + 4 \times 500 = 2500</math></p> <p>3. Where incorrect method is used in part (a), then allow follow through in part (b)</p> <p>(i) (a) = £4.50 (b) = 4000 award 2/2 for (b)</p> <p>(ii) (a) = £10.50 (b) = 1000 award 1/2 for (b)</p> <p>(iii) (a) = £10 (b) = 1071 award 2/2 for (b), (b) = <math>1000 + 500 \div 7</math> award 1/2 for (b) (b) = 1000 award 0/2 for (b)</p>

Question		Expected Answer/s	Max Mark	Additional Guidance								
6		<p>Ans: <math>p = 14</math></p> <ul style="list-style-type: none"> <li>•<sup>1</sup> start to collect like terms: <math>4p = 56</math></li> <li>•<sup>2</sup> collect like terms and equate: <math>4p = 56</math></li> <li>•<sup>3</sup> solve equation for <math>p</math>: <math>p = 14</math></li> </ul>	3	<ol style="list-style-type: none"> <li>1. For the award of the 3<sup>rd</sup> mark an answer of the form '<math>p =</math>' is required</li> <li>2. For answers without valid working eg               <ol style="list-style-type: none"> <li>(i) <math>4p - 2 = 54 \rightarrow 56 \div 4 \rightarrow p = 14</math> award 2/3 ✓×✓</li> <li>(ii) <math>p = 14</math> without working award 1/3 ××✓</li> <li>(iii) <math>56 \div 4 = 14</math> award 1/3 ✓××</li> <li>(iv) <math>7 \times 14 - 2 = 54 + 3 \times 14 \rightarrow p = 14</math> award 1/3 ××✓</li> </ol> </li> <li>3. Answers acceptable for partial credit (valid working must be shown)               <ol style="list-style-type: none"> <li>(i) <math>4p = 56 \rightarrow 14</math> ✓✓× award 2/3</li> <li>(ii) <math>4p = 52 \rightarrow p = 13</math> ✓×✓ award 2/3</li> <li>(iii) <math>10p = 56 \rightarrow p = 5.6</math> ✓×✓ award 2/3</li> <li>(iv) <math>10p = 52 \rightarrow p = 5.2</math> ××✓ award 1/3</li> </ol> </li> </ol>								
7	a	<p>Ans:</p> <table border="1" style="margin-left: 20px;"> <tr> <td>x</td> <td>-2</td> <td>0</td> <td>3</td> </tr> <tr> <td>y</td> <td>-8</td> <td>-2</td> <td>7</td> </tr> </table> <ul style="list-style-type: none"> <li>•<sup>1</sup> calculate <math>y</math> when <math>x = -2</math>: <math>-8</math></li> <li>•<sup>2</sup> calculate <math>y</math> when <math>x = 0</math> and <math>3</math>: <math>-2</math> and <math>7</math></li> </ul>	x	-2	0	3	y	-8	-2	7	2	
x	-2	0	3									
y	-8	-2	7									
7	b	<p>Ans: straight line graph of <math>y = 3x - 2</math></p> <ul style="list-style-type: none"> <li>•<sup>1</sup> correctly plot all three points from the table</li> <li>•<sup>2</sup> draw straight line through the three points shown in the table</li> </ul>	2	<ol style="list-style-type: none"> <li>1. If the line <math>y = 3x - 2</math> is drawn (even if this is not consistent with the points in the table) award 2/2 [minimum acceptable length: line joining <math>(-1, -5)</math> to <math>(1, 1)</math>]</li> <li>2. Where the three points plotted are consistent with the table and are not collinear, the 2<sup>nd</sup> mark is unavailable [Check gradients]</li> <li>3. Where <math>(y, x)</math> is consistently plotted, answer should be followed through with the possibility of awarding the 2<sup>nd</sup> mark</li> </ol>								

Question		Expected Answer/s	Max Mark	Additional Guidance															
8	a	<p>Ans: 15 minutes</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> find mode: 15</li> </ul>	1	<p>1. For an answer of 15            (a) without working, award 1/1            (b) with evidence of an incorrect method, award 0/1            eg 5, 10, 15, 20, 25 [median]  <math>75 \div 5 = 15</math> [“mean”]</p>															
8	b	<p>Ans: <math>\frac{7}{30}</math></p> <ul style="list-style-type: none"> <li>•<sup>1</sup> find probability: <math>\frac{7}{30}</math></li> </ul>	1	<p>1. Accept 7:30, 7 out of 30, 7 in 30, 7-30, 0.23(3...), 23(-3...)%</p>															
8	c	<p>Ans: 16.5</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> complete table:               <table style="margin-left: auto; margin-right: auto;"> <tr><td style="text-align: right;">140</td></tr> <tr><td style="text-align: right;">125</td></tr> <tr><td style="text-align: right; border-top: 1px solid black;">495</td></tr> </table> </li> <li>•<sup>2</sup> know to divide <math>\Sigma fx</math> by 30:  <math>495 \div 30</math></li> <li>•<sup>3</sup> correctly divide <math>\Sigma fx</math> by 30:  <math>= 16.5</math></li> </ul>	140	125	495	3	<p>1. Award of 1<sup>st</sup> mark: 140, 125 and 495 need not appear in table but must be shown in working</p> <p>2. 2<sup>nd</sup> mark may only be awarded for attempting <math>\Sigma fx \div 30</math></p> <p>3. <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Answer</u></th> <th style="text-align: center;"><u>With evidence for 1<sup>st</sup> mark</u></th> <th style="text-align: center;"><u>Without evidence for 1<sup>st</sup> mark</u></th> </tr> </thead> <tbody> <tr> <td>16.5</td> <td style="text-align: center;">3/3 ✓✓✓</td> <td style="text-align: center;">2/3 ✗✓✓</td> </tr> <tr> <td>99 [495 ÷ 5]</td> <td style="text-align: center;">1/3 ✓✗✗</td> <td style="text-align: center;">0/3</td> </tr> <tr> <td>495 ÷ 3 × 10 [= 1650]</td> <td style="text-align: center;">2/3 ✓✓✗</td> <td style="text-align: center;">1/3 ✓✗✗</td> </tr> </tbody> </table></p>	<u>Answer</u>	<u>With evidence for 1<sup>st</sup> mark</u>	<u>Without evidence for 1<sup>st</sup> mark</u>	16.5	3/3 ✓✓✓	2/3 ✗✓✓	99 [495 ÷ 5]	1/3 ✓✗✗	0/3	495 ÷ 3 × 10 [= 1650]	2/3 ✓✓✗	1/3 ✓✗✗
140																			
125																			
495																			
<u>Answer</u>	<u>With evidence for 1<sup>st</sup> mark</u>	<u>Without evidence for 1<sup>st</sup> mark</u>																	
16.5	3/3 ✓✓✓	2/3 ✗✓✓																	
99 [495 ÷ 5]	1/3 ✓✗✗	0/3																	
495 ÷ 3 × 10 [= 1650]	2/3 ✓✓✗	1/3 ✓✗✗																	





# 2011 Mathematics

## Intermediate 1 Units 1, 2 & Applications Paper 1

### Finalised Marking Instructions

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Paper 1

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  - omission or misuse of units (unless marks have been specifically allocated for the purpose in the Marking Instructions)
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15. The symbols ✓ and ✗ are used in the Marking Instructions to give guidance regarding the awarding of marks for specific candidate responses to some questions, eg 'award 2/4 ✓✗✗✓' indicates that the 1<sup>st</sup> & 4<sup>th</sup> marks should be awarded but the 2<sup>nd</sup> & 3<sup>rd</sup> marks should not.

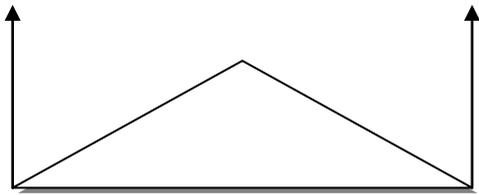
Part Two: Mathematics Intermediate 1: Paper 1, Units 1, 2 and Applications

Question		Expected Answer/s	Max Mark	Additional Guidance
1	a	<p>Ans: 20.37</p> <p>•<sup>1</sup> calculate <math>6 \cdot 47 + 13.9</math>: 20.37</p>	1	
1	b	<p>Ans: 225</p> <p>•<sup>1</sup> calculate <math>\frac{5}{8}</math> of 360: 225</p>	1	
1	c	<p>Ans: 156</p> <p>•<sup>1</sup> calculate <math>12 \times 13</math>: 156</p>	1	
2		<p>Ans: 13 hours 35 minutes</p> <p>•<sup>1</sup> calculate time from 1745 to 0720: 13 hours 35 minutes</p>	1	1. Accept 13.35
3		<p>Ans: 25</p> <p>•<sup>1</sup> know to multiply <math>4 \times (-2)</math> then subtract answer from 17: eg <math>17 - (-8)</math>, <math>17 + 8</math></p> <p>•<sup>2</sup> carry out integer multiplication and subtraction correctly: 25</p>	2	<p>1. Some common answers (no working necessary)</p> <p>(a) 25 award 2/2</p> <p>(b) -26 [<math>13 \times (-2)</math>] award 1/2</p> <p>(c) 8 or -8 award 0/2</p> <p>2. Some common answers (working must be shown)</p> <p>(a) <math>17 - 8 = 9</math> or <math>17 - 8</math> award 1/2</p> <p>(b) <math>-8 - 17 = -25</math> [<math>4 \times (-2) - 17</math>] award 1/2</p> <p>(c) <math>8 - 17 = -9</math> [<math>4 \times (-2) - 17</math>] award 0/2</p> <p>(d) <math>17 - 6 = 11</math> award 0/2</p> <p>(e) <math>17 + 6 = 23</math> award 0/2</p>

Question		Expected Answer/s	Max Mark	Additional Guidance
4	a	<p>Ans: (-7,2) and (5,-6) plotted correctly</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> (-7,2) and (5,-6) plotted correctly:</li> </ul>	1	<ol style="list-style-type: none"> <li>1. Points need not be labelled</li> </ol>
4	b	<p>Ans: (-1,-2)</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> state coordinates of midpoint of PQ: (-1,-2)</li> </ul>	1	<ol style="list-style-type: none"> <li>1. Line PQ need not be drawn</li> <li>2. Accept -1,-2 without brackets or (-1), (-2)</li> <li>3. Where (2, -7) and (-6,5) are plotted in (a) then accept either (-2,-1) or (-1,-2) in (b)</li> </ol>

Question		Expected Answer/s	Max Mark	Additional Guidance
5	a	<p>Ans: £4</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> know how to find cost of additional distance: <math>2 \times 50(p)</math></li> <li>•<sup>2</sup> correctly add £3 to above: <math>(£)3 + 2 \times 50(p) = (£)4</math></li> </ul>	2	<ol style="list-style-type: none"> <li>1. (£)4 without working award 2/2</li> <li>2. Some common answers (working must be shown)               <ol style="list-style-type: none"> <li>(a) <math>3 \times (£)3 + 2 \times 50(p) = (£)10</math> award 1/2</li> <li>(b) <math>(£)3 + 3 \times 50(p) = (£)4.50</math> award 1/2</li> <li>(c) <math>3 \times (£)3 + 3 \times 50(p) = (£)10.50</math> award 0/2</li> <li>(d) <math>(£)3 + 50(p) = (£)3.50</math> award 0/2</li> </ol> </li> </ol>
5	b	<p>Ans: 4500m</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> know to split £7 into £3 + 8×50p</li> <li>•<sup>2</sup> calculate distance: <math>500 + 8 \times 500 = 4500</math></li> </ul>	2	<ol style="list-style-type: none"> <li>1. 4500 without working award 2/2 (irrespective of answer to (a))</li> <li>2. Award 1/2 for these common answers (working must be shown)               <ol style="list-style-type: none"> <li>(a) If candidate uses 50p per 500m, then allow one 500 less or one 500 extra                   <ol style="list-style-type: none"> <li>(i) <math>8 \times 500 = 4000</math></li> <li>(ii) <math>500 + 7 \times 500 = 4000</math></li> <li>(iii) <math>500 + 9 \times 500 = 5000</math></li> </ol> </li> <li>(b) If candidate uses £1 per 1000m, then allow one 1000 less or one 1000 extra                   <ol style="list-style-type: none"> <li>(i) <math>4 \times 1000 = 4000</math></li> <li>(ii) <math>500 + 3 \times 1000 = 3500</math></li> <li>(iii) <math>500 + 5 \times 1000 = 5500</math></li> </ol> </li> <li>(c) If candidate uses £1 per 500m, then £3 + 4 × £1 must be used <math>500 + 4 \times 500 = 2500</math></li> </ol> </li> <li>3. Where incorrect method is used in part (a), then allow follow through in part (b)               <ol style="list-style-type: none"> <li>(i) (a) = £4.50 (b) = 4000 award 2/2 for (b)</li> <li>(ii) (a) = £10.50 (b) = 1000 award 1/2 for (b)</li> <li>(iii) (a) = £10 (b) = 1071 award 2/2 for (b), (b) = <math>1000 + 500 \div 7</math> award 1/2 for (b) (b) = 1000 award 0/2 for (b)</li> </ol> </li> </ol>

Question		Expected Answer/s	Max Mark	Additional Guidance
6	a	<p>Ans: 17</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> evaluate formula: 17</li> </ul>	1	1. Answer may be written in spreadsheet.
6	b	<p>Ans: =AVERAGE(E2..E6)</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> state formula: AVERAGE(E2..E6)</li> </ul>	1	<ol style="list-style-type: none"> <li>1. Accept any punctuation mark or space between E2 and E6</li> <li>2. Accept abbreviations for AVERAGE eg AV(E2..E6)</li> <li>3. Accept SUM(E2..E6)/5 or (E2+E3+E4+E5+E6)/5 [must be / not ÷ ]</li> </ol>

Question		Expected Answer/s	Max Mark	Additional Guidance
7	a	<p>Ans: 1cm to 25km</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> know how to find scale: <math>200 \div 8</math></li> <li>•<sup>2</sup> find scale: 1cm to 25km or equivalent</li> </ul>	2	<p>1. Accept 1cm to 25000m, 1cm to 2500000cm, 1:2500000, 1 box to 25km</p> <p>2. 1cm to 25m or 1:25                      award 1/2</p>
7	b	<p>Ans:</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> one bearing shown correctly: (<math>\pm 2^\circ</math>)</li> <li>•<sup>2</sup> second bearing shown correctly: (<math>\pm 2^\circ</math>)</li> <li>•<sup>3</sup> point of intersection of two bearings shown</li> </ul>	3	<p>1. Where candidate has bearings above the horizontal only the third mark can be awarded for the point of intersection.</p>  <p style="text-align: right;">award 1/3</p> <p>2. If the bearings are not drawn on the diagram:</p> <ul style="list-style-type: none"> <li>(i) Point of intersection in correct position                      award 3/3</li> <li>(ii) Point on correct bearing from either Beta or Gamma                      award 1/3</li> </ul>

Question		Expected Answer/s	Max Mark	Additional Guidance																
8	a	<p>Ans: 15 minutes</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> find mode: 15</li> </ul>	1	<p>1. For an answer of 15            (a) without working, award 1/1            (b) with evidence of an incorrect method, award 0/1            eg 5, 10, 15, 20, 25 [median]  <math>75 \div 5 = 15</math> [“mean”]</p>																
8	b	<p>Ans: <math>\frac{7}{30}</math></p> <ul style="list-style-type: none"> <li>•<sup>1</sup> find probability: <math>\frac{7}{30}</math></li> </ul>	1	<p>1. Accept 7:30, 7 out of 30, 7 in 30, 7-30, 0.23(3...), 23(-3...)%</p>																
8	c	<p>Ans: 16.5</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> complete table:               <table style="margin-left: auto; margin-right: auto;"> <tr><td style="text-align: right;">140</td></tr> <tr><td style="text-align: right;">125</td></tr> <tr><td style="text-align: right;">-----</td></tr> <tr><td style="text-align: right;">495</td></tr> </table> </li> <li>•<sup>2</sup> know to divide <math>\Sigma fx</math> by 30:  <math>495 \div 30</math></li> <li>•<sup>3</sup> correctly divide <math>\Sigma fx</math> by 30:  <math>= 16.5</math></li> </ul>	140	125	-----	495	3	<p>1. Award of 1<sup>st</sup> mark: 140, 125 and 495 need not appear in table but must be shown in working</p> <p>2. 2<sup>nd</sup> mark may only be awarded for attempting <math>\Sigma fx \div 30</math></p> <p>3. <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Answer</u></th> <th style="text-align: center;"><u>With evidence for 1<sup>st</sup> mark</u></th> <th style="text-align: center;"><u>Without evidence for 1<sup>st</sup> mark</u></th> </tr> </thead> <tbody> <tr> <td>16.5</td> <td style="text-align: center;">3/3 ✓✓✓</td> <td style="text-align: center;">2/3 ✗✓✓</td> </tr> <tr> <td>99 [495 <math>\div</math> 5]</td> <td style="text-align: center;">1/3 ✓✗✗</td> <td style="text-align: center;">0/3</td> </tr> <tr> <td>495 <math>\div</math> 3 <math>\times</math> 10 [= 1650]</td> <td style="text-align: center;">2/3 ✓✓✗</td> <td style="text-align: center;">1/3 ✓✗✗</td> </tr> </tbody> </table></p>	<u>Answer</u>	<u>With evidence for 1<sup>st</sup> mark</u>	<u>Without evidence for 1<sup>st</sup> mark</u>	16.5	3/3 ✓✓✓	2/3 ✗✓✓	99 [495 $\div$ 5]	1/3 ✓✗✗	0/3	495 $\div$ 3 $\times$ 10 [= 1650]	2/3 ✓✓✗	1/3 ✓✗✗
140																				
125																				
-----																				
495																				
<u>Answer</u>	<u>With evidence for 1<sup>st</sup> mark</u>	<u>Without evidence for 1<sup>st</sup> mark</u>																		
16.5	3/3 ✓✓✓	2/3 ✗✓✓																		
99 [495 $\div$ 5]	1/3 ✓✗✗	0/3																		
495 $\div$ 3 $\times$ 10 [= 1650]	2/3 ✓✓✗	1/3 ✓✗✗																		





2011 Mathematics

Intermediate 1 Units 1, 2 & Applications Paper 2

Finalised Marking Instructions

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Part One: General Marking Principles for Mathematics Intermediate 1 Units 1, 2 & 3  
Paper 2

*This information is provided to help you understand the general principles you must apply when marking candidate responses to questions in this Paper. These principles must be read in conjunction with the specific Marking Instructions for each question.*

1. Marks for each candidate response must always be assigned in line with these general marking principles and the specific Marking Instructions for the relevant question. If a specific candidate response does not seem to be covered by either the principles or detailed Marking Instructions, and you are uncertain how to assess it, you must seek guidance from the Principal Assessor. You can do this by posting a question on the Marking Team forum. Alternatively, you can refer the issue directly to the Principal Assessor by completing a Principal Assessor Referral form and returning it with the script in the normal way.
2. Marking should always be positive ie, marks should be awarded for what is correct and not deducted for errors or omissions.
3. Award one mark for each ‘bullet’ point shown in the Marking Instructions.
4. Working subsequent to an error must be followed through with the possibility of awarding all remaining marks for the subsequent working, provided the question has not been not simplified as a result of the error. In particular, the answer to one part of a question, even if incorrect, must be accepted as a basis for subsequent dependent parts of the question. Full marks in the dependent part(s) may be awarded provided the question has not been not simplified.
5. Solutions which seem unlikely to include anything of relevance must nevertheless be followed through. Candidates still have the opportunity of gaining one mark or more provided the solution satisfies the criteria for the marks.
6. The following should not be penalised:
  - working subsequent to a correct answer (unless it provides firm evidence that the requirements of the question have not been met)
  - omission or misuse of units (unless marks have been specifically allocated for the purpose in the Marking Instructions)
  - bad form, eg  $\sin x^\circ = 0.5 = 30^\circ$
  - legitimate variation in numerical values/algebraic expressions
7. Full credit should only be given where the solution contains appropriate working. Where the correct answer may be obtained by inspection or mentally, credit may be given, but reference to this will be made in the Marking Instructions.
8. In general only give credit for answers if working is shown. A wrong answer without working receives no credit unless specifically mentioned in the Marking Instructions. The rubric on page one of the question paper states that ‘full credit will be given only where the solution contains appropriate working’.
9. Sometimes the method to be used in a particular question is explicitly stated; no credit should be given where a candidate obtains the correct answer by an alternative method.
10. Where the method to be used in a particular question is not explicitly stated, full credit must be given for alternative methods which produce the correct answer.

11. Do not penalise the same error twice in the same question.
12. Do not penalise a transcription error unless the question has been simplified as a result.
13. Where a solution has been scored out and not replaced then provided the solution is legible marks should be awarded in line with the Marking Instructions for that question.
14. Where more than one solution is given, mark them all and award the least mark.
15. The symbols ✓ and ✗ are used in the Marking Instructions to give guidance regarding the awarding of marks for specific candidate responses to some questions, eg ‘award 2/4 ✓✗✗✓’ indicates that the 1<sup>st</sup> & 4<sup>th</sup> marks should be awarded but the 2<sup>nd</sup> & 3<sup>rd</sup> marks should not.

Part Two: Mathematics Intermediate 1: Paper 2, Units 1, 2 and Applications

Question	Expected Answer/s	Max Mark	Additional Guidance
1	<p>Ans: 50 minutes</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> find number of calories per minute: <math>160 \div 20 = 8</math></li> <li>•<sup>2</sup> find time: <math>400 \div 8 = 50</math></li> </ul>	2	<ol style="list-style-type: none"> <li>1. Correct answer without working award 2/2</li> <li>2. Alternative strategies               <ol style="list-style-type: none"> <li>(a)                   <ul style="list-style-type: none"> <li>•<sup>1</sup> <math>20 \div 160 = 0.125</math></li> <li>•<sup>2</sup> <math>0.125 \times 400 = 50</math></li> </ul> </li> <li>(b)                   <ul style="list-style-type: none"> <li>•<sup>1</sup> <math>400 \div 160 = 2.5</math></li> <li>•<sup>2</sup> <math>2.5 \times 20 = 50</math></li> </ul> </li> <li>(c)                   <ul style="list-style-type: none"> <li>•<sup>1,2</sup> eg <math>\begin{array}{r} 160 \ 20 \\ 160 \ 20 \\ \underline{80 \ 10} \\ 400 \ 50 \end{array}</math></li> </ul> </li> </ol> <p>[In this case award 1/2 for correct strategy with one error.]</p> </li> </ol>
2	<p>Ans: £1129.92</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> find monthly payment: 47.08</li> <li>•<sup>2</sup> find total payment: <math>47.08 \times 24 = 1129.92</math></li> </ul>	2	<ol style="list-style-type: none"> <li>1. Correct answer without working award 2/2</li> <li>2. Some common answers (no working necessary)               <ol style="list-style-type: none"> <li>(a) 2129.92 [<math>1129.92 + 1000</math>] award 1/2</li> <li>(b) 129.92 [<math>1129.92 - 1000</math>] award 1/2</li> <li>(c) 94.16 [<math>47.08 \times 2</math>] award 1/2</li> <li>(d) 1047.08 [<math>47.08 + 1000</math>] award 1/2</li> <li>(e) 952.92 [<math>1000 - 47.08</math>] award 1/2</li> </ol> </li> </ol>

Question	Expected Answer/s	Max Mark	Additional Guidance
3	<p>Ans: <math>150 \text{ cm}^2</math></p> <ul style="list-style-type: none"> <li>•<sup>1</sup> know how to find total area of rectangular faces: <math>5 \times 7 + 8 \times 7 + 5 \times 7</math> or equivalent</li> <li>•<sup>2</sup> know how to find area of a triangular face: <math>\frac{1}{2} \times 8 \times 3</math></li> <li>•<sup>3</sup> calculate total surface area: 150</li> </ul>	3	<ol style="list-style-type: none"> <li>1. Correct answer without working award 3/3</li> <li>2. The final mark can only be awarded for the addition of 5 calculations, except in notes 3 and 4 below.</li> <li>3. Where both triangles are calculated correctly as 1 rectangle, calculation leading to 150 award 3/3</li> <li>4. Where both triangles are calculated as 1 rectangle calculation using incorrect sides then working can be followed through to award the final mark only in the following cases. <ul style="list-style-type: none"> <li>(a) <math>147 [3 \times 7 + 126]</math> award 2/3</li> <li>(b) <math>141 [3 \times 5 + 126]</math> award 2/3</li> <li>(c) <math>135 [3 \times 3 + 126]</math> award 2/3</li> </ul> </li> </ol>

Question		Expected Answer/s	Max Mark	Additional Guidance
4	a	<p>Ans: 1 hour 15 minutes</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> interpret graph: 1 hour 15 minutes (or equivalent)</li> </ul>	1	
4	b	<p>Ans: 80 mph</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> know how to find speed: <math>S = \frac{D}{T}</math></li> <li>•<sup>2</sup> interpret graph: <math>D = 300</math>, <math>T = 3\text{h}45\text{m}</math></li> <li>•<sup>3</sup> calculate speed: <math>300 \div 3.75 = 80</math></li> </ul>	3	<p>1. Correct answer without working award 3/3</p> <p>2. Some common answers (no working necessary, rounding or truncation is acceptable)</p> <p>(a) <math>300 \div 3.45 = 87, 86(.9\dots)</math> award 2/3 ✓✓×</p> <p>(b) <math>300 \div 225 = 1.3(\dots)</math> award 2/3 ✓✓×</p> <p>(c) <math>300 \times 3.75 = 1125</math> award 2/3 ×✓✓</p> <p>(d) <math>300 \times 3.45 = 1035</math> award 1/3 ×✓×</p> <p>(e) <math>300 \times 225 = 67500</math> award 1/3 ×✓×</p> <p>3. Where time is only given in decimal form then 3<sup>rd</sup> mark is only available for division (or multiplication) by: 4.75 (Jack's arrival time), 3.5 (Jill's arrival time), 2.75 (Jill's departure time), 1.75 (difference of J&amp;J's starting times), 1.25 (answer to part a), 0.75 (Jill's journey time).</p> <p>ie <math>300 \div 4.75 = 63</math> ✓×✓  <math>300 \times 0.75 = 225</math> ××✓  <math>300 \div 2.5 = 120</math> ✓××</p> <p>However, 2h30 m leading to <math>300 \div 2.5 = 120</math> ✓×✓</p> <p>4. 3<sup>rd</sup> mark is not available for division by a whole number.</p>

Question	Expected Answer/s	Max Mark	Additional Guidance
5	<p>Ans: £210</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> find cost of letters (per shirt) <math>4 \times 0.15 = 60</math> (p)</li> <li>•<sup>2</sup> find cost of 25 shirts <math>25 \times (9 + 0.60) = 240</math></li> <li>•<sup>3</sup> find discounted cost <math>0.125 \times 240 = 210</math></li> </ul>	3	<ol style="list-style-type: none"> <li>1. Correct answer without working award 3/3</li> <li>2. Common answers, working must be shown <ul style="list-style-type: none"> <li>(a) 8.40 [87.5% of 9.60] award 2/3</li> <li>(b) 236.25 [12 letters <math>\times</math> 15p .....] award 2/3</li> <li>(c) 196.87 (.88) [87.5% of 225] award 2/3</li> <li>(d) 225.60 [225 + 60p] award 1/3</li> <li>(e) 197.40 [87.5% of 225.60] award 2/3</li> </ul> </li> <li>3. For award of the final mark answers must be rounded or truncated to the nearest penny.</li> </ol>
6	<p>Ans: 18 minutes</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> know how to find volume of tank: <math>90 \times 60 \times 50</math></li> <li>•<sup>2</sup> know how to find volume in litres: <math>(90 \times 60 \times 50) \div 1000</math></li> <li>•<sup>3</sup> know how to find time: <math>[(90 \times 60 \times 50) \div 1000] \div 15</math></li> <li>•<sup>4</sup> calculate <math>[(\text{volume}) \div 1000] \div 15 = 18</math></li> </ul>	4	<ol style="list-style-type: none"> <li>1. Correct answer with no working award 4/4</li> <li>2. Some common answers (working must be shown) <ul style="list-style-type: none"> <li>(a) <math>270000 \div 15 \div 60 = 300</math> ✓×✓× award 2/4</li> <li>(b) <math>270000 \div 1000 \div 60 = 4.5</math> ✓✓×× award 2/4</li> <li>(c) <math>[(90 + 60 + 50) \div 1000] \div 15 = 0.013</math> ×✓✓✓ award 3/4</li> </ul> </li> </ol>

Question		Expected Answer/s	Max Mark	Additional Guidance
7	a	<p>Ans: 3698</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> find 'Liberal' angle: 43</li> <li>•<sup>2</sup> know how to find number of Liberal votes:  <math>\frac{43}{360} \times 30960</math>  or  <math>\frac{30960}{360} \times 43</math>  or  <math>43 \div (360 \div 30960)</math></li> <li>•<sup>3</sup> find number of Liberal votes: 3698</li> </ul>	3	<ol style="list-style-type: none"> <li>1. Correct answer without working award 3/3</li> <li>2. 27262 [<math>\frac{317}{360} \times 30960</math>] award 2/3 ×✓✓ (no working necessary)</li> <li>3. A common answer (working must be shown) 43% of 30960 = 13312(·8), 13313 award 1/3 ✓××</li> <li>4. Do not award third mark where premature rounding results in wrong answer eg  <math>\frac{43}{360} \times 30960 = 0.12 \times 30960 = 3715(-2)</math> award 2/3 ✓✓×</li> </ol>
7	b	<p>Ans: In the by-election more voted SNP fewer voted Labour more voted Liberal</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> state any one of the above differences</li> <li>•<sup>2</sup> state another one of the above differences</li> </ul>	2	<ol style="list-style-type: none"> <li>1. Disregard invalid statements. eg SNP increased ✓ Labour decreased ✓ Liberal decreased × award 2/2</li> <li>2. Disregard incorrect numerical references. eg SNP gained 70° Labour lost 90° award 2/2</li> <li>3. Some common answers (a) Labour lost votes to SNP award 2/2 (b) In 2005 Labour had much more than SNP, but in 2008 they were close to each other. award 1/2</li> </ol>



Question	Expected Answer/s	Max Mark	Additional Guidance
10	<p>Ans: £35</p> <p>•<sup>1,2</sup> know how to calculate interest:  <math>\frac{7.5}{100} \times 1400 \times \frac{4}{12}</math>            (award 1 for <math>\frac{7.5}{100} \times 1400</math>            or <math>\frac{4}{12} \times \frac{7.5}{100}</math>            or <math>\frac{4}{12} \times 1400</math>)</p> <p>•<sup>3</sup> carry out percentage and fraction calculations correctly: 35</p>	3	<p>1. Correct answer without working award 3/3</p> <p>2. If answer is 1435 [1400 + 35] (no working necessary)            (a) award 3/3 if candidate states that interest is 35            (b) award 2/3 if candidate does not state that interest is 35</p> <p>3. Acceptable answers for partial credit (no working necessary)            (a) 105 [7.5% of 1400] award 1/3            (b) 2.5 [<math>\frac{4}{12} \times 7.5</math>] award 1/3            (c) 466.67 or 466.66 [<math>\frac{4}{12} \times 1400</math>] award 1/3            (d) 420 [105 × 4] award 1/3</p> <p>4. The following common wrong answers illustrate where the 3<sup>rd</sup> mark is available to candidates, working must be shown.            (a) <math>1400 \times \frac{100}{7.5} \times \frac{4}{12} = 6222.22</math> × ✓✓            (note: answer must be rounded or truncated to nearest penny)            (b) <math>1400 \div 7.5 \times \frac{4}{12} = 62.22</math> × ✓×            (c) <math>1400 \times \frac{7.5}{100} \times \frac{12}{4} = 315</math> ✓×✓            (d) <math>1400 \times 0.75 \times \frac{12}{4} = 3150</math> ××✓</p>

Question	Expected Answer/s	Max Mark	Additional Guidance
11	<p>Ans: £1.75 worse off</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> find current Saturday pay: <math>7 \times 1.5 \times 8 = 84</math></li> <li>•<sup>2</sup> find current pay: <math>4 \times 7 \times 8 + \text{Saturday pay} = 308</math></li> <li>•<sup>3</sup> find new pay: <math>5 \times 7 \times 8.75 = 306.25</math></li> <li>•<sup>4</sup> state conclusion: £1.75 worse off</li> </ul>	4	<ol style="list-style-type: none"> <li>1. Correct answer without working award 4/4</li> <li>2. Evidence for the award of second mark Accept <math>224 + 28 (7 \times 0.5 \times 8) = 252</math> Do not accept (a) <math>24 + 12 (1.5 \times 8) = 236</math> (b) <math>224 + 10.5(1.5 \times 7) = 245.5(0)</math> (c) <math>(224 \times 1.5) = 336</math></li> <li>3. Where the wrong number of days has been used (a) Where only 1 day has been used, follow through working with the possibility of awarding 2/4. eg Current = <math>7 \times 1.5 \times 8 = 84</math> ✓× New pay = <math>7 \times 8.75 = 61.25</math> × Worse off by 22.75 ✓ (b) Where any other incorrect number of days have been used, follow through working with the possibility of awarding 3/4. eg Current = <math>5 \times 56 + 84 = 364</math> ✓× New pay = <math>6 \times 61.25 = 367.50</math> ✓ Better off by 3.50 ✓</li> <li>4. Award 3<sup>rd</sup> mark for 306.25 irrespective of number of days used for current pay.</li> <li>5. For award of 4<sup>th</sup> mark, candidate must state worse/better (or equivalent) and by how much.</li> </ol>

Question		Expected Answer/s	Max Mark	Additional Guidance
12	a	<p>Ans: 7</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> identify <math>Q_1</math> and <math>Q_3</math>: 15 and 22</li> <li>•<sup>2</sup> calculate interquartile range: 7</li> </ul>	2	<ol style="list-style-type: none"> <li>1. Correct answer without working award 2/2</li> <li>2. The second mark is available for correctly subtracting any pair of numbers from the Craigtown boxplot. eg <math>26 - 12 = 14</math> (range)      award 1/2</li> <li>3. Some common answers (working must be shown) (a) <math>\frac{1}{2}(22 - 15) = 3.5</math> (SIQR) award 1/2 (b) <math>23 - 18 = 5</math> (Scottsburgh IQR) award 1/2</li> </ol>
	b	<p>Ans: Scottsburgh has a higher median and a smaller interquartile range</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> interpret boxplot: Scottsburgh has a higher median</li> <li>•<sup>2</sup> interpret boxplot: Scottsburgh has a smaller interquartile range</li> </ul>	2	<ol style="list-style-type: none"> <li>1. Award of 1<sup>st</sup> mark (a) accept eg (i) Scottsburgh is 21 and Craigtown is 18 (ii) Scottsburgh's box is higher (b) do not accept eg Scottsburgh's boxplot is higher</li> <li>2. Award of 2<sup>nd</sup> mark (a) accept eg Scottsburgh's box is smaller (b) do not accept eg Scottsburgh's boxplot is smaller</li> </ol>

Question	Expected Answer/s	Max Mark	Additional Guidance
13	<p>Ans: 36% (See Note 1)</p> <ul style="list-style-type: none"> <li>•<sup>1</sup> find loss: 45</li> <li>•<sup>2</sup> know to express loss as a fraction of 125: <math>\frac{45}{125}</math></li> <li>•<sup>3</sup> know to multiply fraction by 100: <math>\frac{45}{125} \times 100</math></li> <li>•<sup>4</sup> carry out all calculations correctly: 36</li> </ul>	4	<p>1. Correct answer without working award 2/4</p> <p><b>Be aware <math>\frac{45}{100} \times 80 = 36</math> award 2/4 ✓××✓</b></p> <p>When the only working is 45 and 36 award 2/4 ✓××✓</p> <p>2. 4<sup>th</sup> mark is only available for calculations of the form <math>\frac{a}{b} \times c</math> where a,b,c = calculated loss or 125 or 80 or 100.</p> <p>3. Some common answers (working must be shown)</p> <p>(a) (i) <math>56(.25) [\frac{45}{80} \times 100]</math> award 3/4 ✓××✓✓</p> <p>(ii) <math>56(.25) [\frac{45}{100} \times 125]</math> award 2/4 ✓××✓</p> <p>When the only working is 45 and 56(.25) award 2/4 ✓××✓</p> <p>(b) <math>64 [\frac{80}{125} \times 100]</math> award 3/4 ×✓✓✓</p> <p>(c) <math>178, 177(.7\dots) [\frac{80}{45} \times 100]</math> award 3/4 ✓×✓✓</p> <p>(d) <math>156(.25) [\frac{125}{80} \times 100]</math> award 2/4 ××✓✓</p> <p>(e) <math>100 [\frac{80}{100} \times 125</math> or <math>\frac{125}{100} \times 80]</math> award 1/4 ×××✓</p>

Question	Expected Answer/s	Max Mark	Additional Guidance
14	<p>Ans: 5.2 cm<sup>2</sup></p> <ul style="list-style-type: none"> <li>•<sup>1</sup> know to calculate area of semi-circle: <math>\frac{1}{2} \pi r^2</math></li> <li>•<sup>2</sup> substitute correct radius into formula: <math>\frac{1}{2} \times \pi \times 1.4^2</math></li> <li>•<sup>3</sup> know to add area of triangle to area of semi-circle: <math>\frac{1}{2} \times \pi \times 1.4^2 + \frac{1}{2} \times 2.8 \times 1.5</math></li> <li>•<sup>4</sup> carry out all calculations correctly: <math>3.07\dots + 2.1 = 5.17\dots</math> (must include a circle calculation followed by an addition)</li> <li>•<sup>5</sup> round to one decimal place: 5.2</li> </ul>	5	<ol style="list-style-type: none"> <li>1. Correct answer without working award 0/5</li> <li>2. Some common answers (working must be shown) <ul style="list-style-type: none"> <li>(a) 8.3 [<math>\pi \times 1.4^2 + \frac{1}{2} \times 2.8 \times 1.5</math>] award 4/5 <math>\times \checkmark \checkmark \checkmark \checkmark</math></li> <li>(b) 7.3 [<math>\frac{1}{2} \times \pi \times 1.4^2 + 2.8 \times 1.5</math>] award 4/5 <math>\checkmark \times \checkmark \checkmark \checkmark</math></li> <li>(c) 14.4 [<math>\frac{1}{2} \times \pi \times 2.8^2 + \frac{1}{2} \times 2.8 \times 1.5</math>] award 4/5 <math>\checkmark \times \checkmark \checkmark \checkmark</math></li> <li>(d) 6.5 [<math>\frac{1}{2} \times \pi \times 2.8 + \frac{1}{2} \times 2.8 \times 1.5</math>] award 4/5 <math>\times \checkmark \checkmark \checkmark \checkmark</math></li> <li>(e) 4.3 [<math>\frac{1}{2} \times \pi \times 1.4 + \frac{1}{2} \times 2.8 \times 1.5</math>] award 3/5 <math>\times \times \checkmark \checkmark \checkmark</math></li> <li>(f) 3.1 [<math>\frac{1}{2} \times \pi \times 1.4^2</math>] award 3/5 <math>\checkmark \checkmark \times \times \checkmark</math></li> <li>(g) 6.2 [<math>\pi \times 1.4^2</math>] award 2/5 <math>\times \checkmark \times \times \checkmark</math></li> <li>(h) 4.4 [<math>\frac{1}{2} \times \pi \times 2.8</math>] award 2/5 <math>\times \checkmark \times \times \checkmark</math></li> <li>(i) 8.8 [<math>\pi \times 2.8</math>] award 2/5 <math>\times \checkmark \times \times \checkmark</math></li> <li>(j) 2.2 [<math>\frac{1}{2} \times \pi \times 1.4</math>] award 1/5 <math>\times \times \times \times \checkmark</math></li> </ul> </li> <li>3. (a) 5<sup>th</sup> mark is only available where the final answer or answer to circle calculation requires rounding. (b) Where premature rounding leads to incorrect answer, a maximum of 4/5 is available eg triangle = <math>(\frac{1}{2} \times 1.4 \times 1.5) \times 2</math> = <math>1.05 \times 2</math> = <math>1.1 \times 2</math> total area = <math>2.2 + 3.1 = 5.3</math></li> </ol>

TOTAL MARKS FOR PAPER 2  
50

TOTAL MARKS FOR  
PAPER 1 & 2  
80

[END OF MARKING INSTRUCTIONS]