OCR
Oxford Cambridge and RSA

GCSE

Mathematics (9-1)

Unit **J560/06:** Paper 6 (Higher Tier)

General Certificate of Secondary Education

Mark Scheme for June 2017

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

Annotations used in the detailed Mark Scheme.

Annotation	Meaning
	Correct
	Incorrect
BOD	Benefit of doubt
FT	Follow through
ISW	Ignore subsequent working (after correct answer obtained), provided method has been completed
M0	Method mark awarded 0
M1	Method mark awarded 1
M2	Method mark awarded 2
A1	Accuracy mark awarded 1
B1	Independent mark awarded 1
B2	Independent mark awarded 2
MR	Misread
SC	Special case
^	Omission sign

Subject-Specific Marking Instructions

1. **M** marks are for using a correct method and are not lost for purely numerical errors.
   A marks are for an accurate answer and depend on preceding **M** (method) marks. Therefore **M0 A1** cannot be awarded.
   B marks are independent of **M** (method) marks and are for a correct final answer, a partially correct answer, or a correct intermediate stage.
   SC marks are for special cases that are worthy of some credit.

2. Unless the answer and marks columns of the mark scheme specify **M** and **A** marks etc, or the mark scheme is 'banded', then if the correct answer is clearly given and is not from wrong working **full marks** should be awarded.

   Do not award the marks if the answer was obtained from an incorrect method, ie incorrect working is seen and the correct answer clearly follows from it.

3. Where follow through (**FT**) is indicated in the mark scheme, marks can be awarded where the candidate's work follows correctly from a previous answer whether or not it was correct.

   Figures or expressions that are being followed through are sometimes encompassed by single quotation marks after the word *their* for clarity, eg FT 180 × (*their* '37' + 16), or FT 300 – $\sqrt{}$(*their* '$5^2 + 7^2$'). Answers to part questions which are being followed through are indicated by eg FT 3 × *their* (a).

   For questions with FT available you must ensure that you refer back to the relevant previous answer. You may find it easier to mark these questions candidate by candidate rather than question by question.

4. Where dependent (**dep**) marks are indicated in the mark scheme, you must check that the candidate has met all the criteria specified for the mark to be awarded.

5. The following abbreviations are commonly found in GCSE Mathematics mark schemes.

   - **figs 237**, for example, means any answer with only these digits. You should ignore leading or trailing zeros and any decimal point eg 237000, 2.37, 2.370, 0.00237 would be acceptable but 23070 or 2374 would not.
   - **isw** means **ignore subsequent working** after correct answer obtained and applies as a default.
   - **nfww** means **not from wrong working**.
   - **oe** means **or equivalent**.
   - **rot** means **rounded or truncated**.
   - **seen** means that you should award the mark if that number/expression is seen anywhere in the answer space, including the answer line, even if it is not in the method leading to the final answer.
   - **soi** means **seen or implied**.

6. In questions with no final answer line, make no deductions for wrong work after an acceptable answer (ie **isw**) unless the mark scheme says otherwise, indicated by the instruction 'mark final answer'.

7. In questions with a final answer line following working space,

   (i) if the correct answer is seen in the body of working and the answer given on the answer line is a clear transcription error allow full marks unless the mark scheme says 'mark final answer'. Place the annotation ✓ next to the correct answer.

   (ii) if the correct answer is seen in the body of working but the answer line is blank, allow full marks. Place the annotation ✓ next to the correct answer.

   (iii) if the correct answer is seen in the body of working but a completely different answer is seen on the answer line, then accuracy marks for the answer are lost. Method marks could still be awarded. Use the M0, M1, M2 annotations as appropriate and place the annotation × next to the wrong answer.

8. In questions with a final answer line:

   (i) If one answer is provided on the answer line, mark the method that leads to that answer.

   (ii) If more than one answer is provided on the answer line and there is a single method provided, award method marks only.

   (iii) If more than one answer is provided on the answer line and there is more than one method provided, award zero marks for the question unless the candidate has clearly indicated which method is to be marked.

9. In questions with no final answer line:

   (i) If a single response is provided, mark as usual.

   (ii) If more than one response is provided, award zero marks for the question unless the candidate has clearly indicated which response is to be marked.

10. When the data of a question is consistently misread in such a way as not to alter the nature or difficulty of the question, please follow the candidate's work and allow follow through for **A** and **B** marks. Deduct 1 mark from any **A** or **B** marks earned and record this by using the MR annotation. **M** marks are not deducted for misreads.

11. Unless the question asks for an answer to a specific degree of accuracy, always mark at the greatest number of significant figures even if this is rounded or truncated on the answer line. For example, an answer in the mark scheme is 15.75, which is seen in the working. The candidate then rounds or truncates this to 15.8, 15 or 16 on the answer line. Allow full marks for the 15.75.

12. Ranges of answers given in the mark scheme are always inclusive.

13. For methods not provided for in the mark scheme give as far as possible equivalent marks for equivalent work. If in doubt, consult your Team Leader.

14. Anything in the mark scheme which is in square brackets […] is not required for the mark to be earned, but if present it must be correct.

MARK SCHEME

Question			Answer	Marks	Part marks and guidance	
1	a		53 500 000	**1** **1 AO1.2**		
	b		1.02×10^7	**2** **2 AO1.3b**	**B1** for answer figs102	
	c		15 nfww	**4** **3 AO1.3b** **1 AO3.1d**	**B3** for 15.07 to 15.1 nfww OR **B1** for figs 637 and **M1** for $\frac{73.3\times10^6 - \textit{their}63.7\times10^6}{\textit{their}63.7\times10^6}$ oe or $\frac{73.3\times10^6}{\textit{their}63.7\times10^6}$ oe and **M1dep** interpretation of answer to division as a percentage increase soi by answer	*their* 63.7×10^6 can be an error from their sum, *their* (b) or one of the country populations Allow **M1M1** for (England answer) 37 (Wales answer) 2300 (Scotland answer) 1300 (NI answer) 3900 ((b) answer) 620
2	a	i	9.6	**1** **1 AO1.3a**		
		ii	2500	**1** **1 AO1.2**		Condone 1 : 2500

Question			Answer	Marks	Part marks and guidance	
	b		Arc centre B radius 6 cm meeting AB and CB or AB and bisector of ADC	**2**	**B1** for any arc centre B meeting AB and BC or short arc (at least 1cm) radius 6 cm centre B	Accept dashed or dotted for all marks Freehand, all within template, max **B1** Allow beyond AB and BC for 1 or 2 marks Tolerance 5.8 to 6.2 cm
			Ruled bisector of angle ADC to reach BC with construction arcs or Bisector with construction arcs from BC to *their* arc centre B	**2**	**B1** for correct ruled bisector at least 2cm long by eye with no construction arcs or correct construction arcs with no bisector drawn	Tolerance $\pm$ 2° Construction arcs on AD and on DC and two intersecting arcs from these
			Correct region shaded	**1** **1 AO2.3a** **2 AO2.3b** **1 AO3.1d** **1 AO3.3**	**Dep** on **B1** and **B1** If 0 scored **SC1** for 6 [cm] [= 150] [m] seen	
3	**a**	**i**	Point (0.8, 120) indicated	**1** **1 AO2.1b**		
		ii	No oe **and** Correct supporting value(s) and justification	**2** **1 AO2.1b** **1 AO3.4b**	**B1** for 200 to 260 visitors expected or about 0 to 1mm and 320 or line of best fit within overlay or negative trend/correlation or marking(s) in relevant region above 2mm or 2 or more values within overlay and surrounding 2mm	Justification includes Reference to line of best fit (drawn or not) or trend or negative correlation or marking(s) in relevant region above 2mm or surrounding value**s** **See Appendix**

Question			Answer	Marks	Part marks and guidance	
		iii	Outside range of data [collected]	**1** **1 AO3.4a**		**Accept** "The data (or diagram) only goes to 5.5 (or 6)" oe **Do not accept** "by 6 to 7 it would give no visitors" oe or There is no data around 9 mm oe The line of best fit does not reach 9 mm oe **Condone** "[Because] there would be a negative number of people" **See Appendix**
	b		Total number or number of children is not known oe or The chart only shows proportions/percentages oe	**1** **1 AO2.5b**	Mark the best bit so long as no contradiction	**See Appendix**

Question			Answer	Marks	Part marks and guidance	
4			4 : 11 or exact equivalent	3 2 AO1.3b 1 AO3.1d	**B2** for $\frac{4}{15}$ nfww oe soi by 0.26[6…] to 0.27 or answer 11 : 4 or answer 4 : 15 OR **M1** for $\frac{2}{3}\times\frac{2}{5}$ OR **B1** for $\frac{2n}{3}$ evaluated where *n* is their total number of students **Alternative method:** [Spanish : Other : None] **B2** 4 : 6 : 5 soi OR Spanish : Other [: None] **M1** 2 : 3 [: 2.5]	Implied by eg $\frac{4n}{15}$ evaluated where *n* is their total number of students NB $0.2\dot{6} : 0.7\dot{3}$ scores **3** marks but $0.2\dot{6} : 0.7\dot{4}$ only scores **B2** NB $\frac{4}{15}$ from $\frac{2}{3}-\frac{2}{5}$ scores **0** **0** for just 2 : 3 without labelling
5	a	i	$-\frac{1}{4}$ oe	2 2 AO1.3a	**M1** for $\frac{\pm(3-6)}{\pm(8-^{-}4)}$ or answer $\frac{1}{4}$ oe or answer $-\frac{1}{4}x$	
		ii	$y=-\frac{1}{4}x+5$ oe	2 2 AO1.3b	**M1** for substitution of (-4, 6) or (8, 3) into $y = mx + c$ or into $y - y_1 = m(x - x_1)$ or intercept clearly identified as 5 (may be on diagram or in equation)	eg final answer for 2 marks $y - 3 = -\frac{1}{4}(x - 8)$ oe or $y - 6 = -\frac{1}{4}(x - -4)$ oe Missing "*y* =" scores **M1** max.

Question			Answer	Marks	Part marks and guidance	
	b		$y = -\frac{1}{4}x - 2$ oe or FT	**2FT** **2 AO2.1a**	**B1FT** for y = *their* mx [+ a] where m is FT **B1** for $y = bx - 2$, $b \neq 0$	FT is for *their* gradient in (a)(ii) (if no answer in (a)(ii) then use (a)(i)) Condone missing "y =" if already penalised in (a)(ii), otherwise missing "y =" is **B1** max
6	**a**	**i**	<table><tr><th>×</th><th>1</th><th>2</th><th>2</th><th>3</th><th>4</th></tr><tr><td>1</td><td>1</td><td>2</td><td>2</td><td>3</td><td>4</td></tr><tr><td>2</td><td>2</td><td>4</td><td>4</td><td>6</td><td>8</td></tr><tr><td>2</td><td>2</td><td>4</td><td>4</td><td>6</td><td>8</td></tr><tr><td>3</td><td>3</td><td>6</td><td>6</td><td>9</td><td>12</td></tr><tr><td>4</td><td>4</td><td>8</td><td>8</td><td>12</td><td>16</td></tr></table>	**2** **2 AO1.3a**	**B1** for table completed with no more than 5 errors or omissions	Ignore negative signs
		ii	$\frac{9}{25}$ oe	**2** **1 AO2.1a** **1 AO2.3a**	**B1FT** for *their* correct numerator **B1** for fraction with denominator 25	Ignore attempts to convert form or simplify Accept [0].36 or 36% but not ratio or in words
	b		Spinner completed with 3 negative numbers and 2 positives or 2 negatives and 3 positives	**3** **2 AO3.1a** **1 AO3.2**	**M1** for $\frac{12}{25}$ soi eg by 12 [out of 25] **M1** for spinner with 5 numbers inserted, at least one negative	Do not accept 0 for **3** marks Not just 12 as a number on the spinner Condone 0 (as positive) for **M1**
7	**a**		8	**1** **1 AO1.3a**		

Question			Answer	Marks	Part marks and guidance	
	b		Correct curve	**2** **2 AO2.3b**	**B1FT** for 4, 5 or 6 points plotted correctly	½ square tolerance **B1** max if line ruled (between any points)
	c		$^{-}0.9$ to $^{-}0.6$ 2.6 to 2.9	**2** **2 AO2.1a**	**B1** for each If 0 scored **SC1** for ($^{-}0.9$ to $^{-}0.6$, 2) and (2.6 to 2.9, 2)	If more than two answers mark the worst two Condone for **2** marks when both answers in body but only one given on answer line
8			2.7 nfww	**5** **2 AO1.3b** **1 AO3.1d** **1AO3.2** **1 AO3.3**	Allow 2.70 to 2.71 **M2** for $4 \times 4 \times 8 \times 0.67$ or **M1** for $4 \times 4 \times 8$ AND **M1** for $\frac{1}{3} \times 4 \times 4 \times (13 - 8)$ AND **M1** for *their* 85.76 + *their* 26.7x = 158 oe	Condone for full marks minor inaccuracies from rounding if final answer given as 2.7 = 85.76 (mass of cuboid) = 128 (vol of cuboid) = 26.6 to 26.7 (vol of pyramid) eg (x =) $\frac{158 - \textit{their}85.76}{\textit{their}26.7}$

Question			Answer	Marks	Part marks and guidance	
9	a		Triangle with vertices at (1, 6), (2, 6), (2, 4)	**3** 3 AO2.3b	**B2** for triangle correct size and orientation in wrong position OR **B1** for enlargement centre (-1, 5) incorrect scale factor < 1 or for triangle with two vertices correct or for three rays from (-1, 5) to vertices of triangle A or for triangle correct size but wrong orientation	
	b	i	Height factor is square root of area factor oe in words or figures	**1** 1 AO2.5a	Mark the best bit so long as no contradiction	Must include correct reference to square or square root
		ii	16.5 to 16.6	**3** 2 AO1.3b 1 AO3.1b	**B2** for $\left(\sqrt{3}\right)^3$ oe or $\frac{1}{\left(\sqrt{3}\right)^3}$ oe soi by 5.19 to 5.20 or 0.192 to 0.193 OR **B1** for $\sqrt{3}$ or $\frac{1}{\sqrt{3}}$ oe soi by 1.73[…] or 0.577[…]	Accept $\frac{86\sqrt{3}}{9}$ oe Note that $\left(\sqrt{3}\right)^3 = 3\sqrt{3}$ and $\frac{1}{\left(\sqrt{3}\right)^3} = \frac{\sqrt{3}}{9}$

Question			Answer	Marks	Part marks and guidance	
10	a		Fds 7, 8.4, 4, 3.6, 1.4, 0.55	1	At least 3 correct; may be implied by height of 3 bars including one of the last two	
			Bars all of correct height	1	Tolerance 1 mm unless on gridlines	FT *their* scale. Heights may be indicated by a plotted point, stick etc Ignore polygon lines
			Bars all of correct width	1		Condone missing vertical lines if tops correct width
			Vertical axis with consistent linear scale starting from 0 soi and labelled 'Frequency denisity' oe	1 1 AO1.3a 3 AO2.3b	**B0** for scale 0 to 42 etc for frequency graph even if labelled frequency density	Accept abbreviations or an area key eg 1 cm^2 = 5
	b		Answer £17 to £18 inclusive with valid working and justification	4 1 AO1.3b 1 AO3.1d 1 AO3.2 1 AO3.3	**M1** for 25% of 140 = 35 or 75% of 140 = 105 **M1dep** for identification of 15 to 20 soi **A1** for answer £17 to £18 inclusive **B1dep on M1M1A1** for justification If **0** scored, then **SC1** for an answer £15 to £20	 eg implied by frequencies 25 and 43 or 97 and 115 or by answer in range 15 to 20 Justification can be based on a calculation eg $\frac{10}{18}$ of 15 to 20 bar or reasoning eg 18% spent £20 and 30/31% spent £15, so 25% is just over/about halfway.

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Part marks and guidance</th><th></th></tr>
<tr><td>11</td><td></td><td></td><td>No,
with correct calculation leading to 23.77 to 23.8 identified
or with 7.32 compared with 7.25 oe
or 302 compared with 305 oe</td><td>4
1 AO1.3b
2 AO3.1d
1 AO3.3</td><td>B1 for 7250 or 7.25 seen
B1 for 305 or 0.305 seen

M1 for their 7.25 ÷ their 0.305 with consistent units and at least one attempted bound
or for their 0.305 × 24 oe
or their 7250 ÷ 24 oe</td><td>Ignore upper bound
Ignore lower bound

Their 7.25 in range 7 to 8, their 0.305 in range 0.29 to 0.31 or equivs.
Ignore other divisions or products
M0 for 7500 ÷ 300 or 7.5 ÷ 0.3</td></tr>
<tr><td>12</td><td></td><td></td><td><table><tr><td>x</td><td>10</td><td>6</td><td>[±] 15</td></tr><tr><td>y</td><td>9</td><td>25</td><td>4</td></tr></table></td><td>4
1 AO1.1
3 AO1.3a</td><td>B3 for one value correct

OR

M2 for $9 \times 10^2 = y \times 6^2$ oe
or $9 \times 10^2 = 4 \times x^2$ oe

OR
M1 for 9×10^2 or $y = \frac{k}{x^2}$ soi</td><td>Do not follow through mis-reads.</td></tr>
</table>

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Part marks and guidance</th><th></th></tr>
<tr><td>13</td><td></td><td></td><td>Three of these

• OC is common or shared
• OA = OB (equal) radii
• ∠OAC = ∠OBC tangent perpendicular to radius
• CA = CB tangents from a point [to a circle]

RHS, SSS or SAS as appropriate</td><td>M3

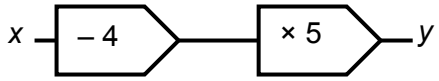
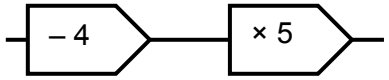
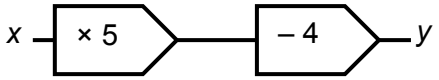
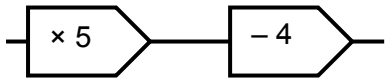
A1
4 AO2.4b</td><td>M1 for each

After M0,
B2 three pairs of these equal sides/angles with insufficient or no reasons
or
B1 for two pairs of these equal sides/angles identified with insufficient or no reasons

OR

After M1,
B1 for two further pairs of these equal sides/angles identified with insufficient or no reasons</td><td>Ignore extra facts and reasons

For B marks accept if indicated on diagram</td></tr>
<tr><td>14</td><td>a</td><td></td><td><table><tr><th>x</th><th>y</th></tr><tr><td>-5</td><td>-4</td></tr><tr><td>2.5</td><td>11</td></tr></table></td><td>2
2 AO1.3a</td><td>B1 for one correct</td><td></td></tr>
</table>

Question			Answer	Marks	Part marks and guidance	
	b		$y = 5(x-4)$ oe or  	**2** **1 AO1.1** **1 AO1.3a**	**M1** for correct operations in correct order but poor notation eg $y = x – 4 × 5$ or $5(x – 4)$ oe  (as minimum allow – 4 , × 5 if intent clear) or for correct operations in reverse order eg implied by $y = 5x – 4$  	For **2** marks and **M1** condone x and y transposed in algebraic expression or transposed in flow diagram. **M0** for wrong order and poor notation  Mark right-to-left flow diagrams in a similar way Condone correct flow diagram followed by incorrect algebra or vice-versa

Question			Answer	Marks	Part marks and guidance	
	c		$5p - 3$ as final answer	**4** **1 AO1.3b** **3 AO3.1b**	**M1** for $2p + 4 - 4$ soi **M1** for *their* $2p \times 5$ soi **M1** for *their* $10p \div 2$ **M1** for *their* $5p - 3$ **Maximum 3 marks if answer incorrect** **Alternative method:** **M1** for $2(m + 3)$ soi **M1** for $\frac{\textit{their}\,2(m+3)}{5} + 4$ soi **M1** for *their* $\frac{2(m+3)}{5} + 4 = 2p + 4$ or better **M1FT** for rearranging *their* equation to isolate m **Maximum 3 marks if answer incorrect**	Output of function A is $10p$ implies first **M1M1** Use of function A Use of function B with output of A Equating their output of B with $2p + 4$ *Their* equation must be of form $\frac{am+b}{5} + 4 = 2p + 4$ oe where $a \neq 0$ and $b \neq 0$, leading to $(m =)\frac{10p-b}{a}$ and then simplified if possible Accept another letter used consistently for m or p but not m and p interchanged
15	**a**		Correct sketch with max at (90, 1) and min at (270, -1) and crossing x-axis at 0, 180 and 360	**2** **2 AO2.3b**	**M1** for correct shape starting at (0, 0) but inaccurate at roots and max/min. Needs at least one cycle, but may have more than one.	

Question			Answer	Marks	Part marks and guidance	
	b		217° and 323°	**4** **1 AO1.3b** **1 AO3.1b** **1 AO3.2** **1 AO3.3**	**B3** for one correct even if from trials OR **M2** for [x =] ⁻37 to ⁻36.86 OR **M1** for sin x = ⁻0.6 oe If **0** scored **SC1** answers summing to 540 to 3sf	Accept answers to greater accuracy 216.8[6…] and 323.1[3…] **B3** for grads: [x =] (⁻41), 221, 319 OR **B2** for grads: [x =] one of 221, 319 OR **M1** implied for grads [x =] ⁻41 or rads: [x =] ⁻0.64[…]
16	**a**		$3y^7$	**1** **1 AO1.3a**		
	b		$\frac{7x+2}{(x-1)(x+2)}$ or $\frac{7x+2}{x^2+x-2}$ as final answer	**3** **3 AO1.3b**	**B1** for $(x-1)(x+2)$ or x^2+x-2 seen as a denominator **M1** for $3(x+2)+4(x-1)$ or $3x+6+4x-4$ soi	Condone missing final bracket. Accept not in fraction or seen in separate fractions
17			$\frac{\sqrt[3]{81}}{3}=\frac{\sqrt[3]{3^4}}{3}$ or $\frac{\sqrt[3]{81}}{3}=\frac{\sqrt[3]{3^4}}{3}$ $=\frac{3^{\frac{4}{3}}}{3}$ or $\frac{\sqrt[3]{3^3\times 3}}{3}=\frac{3\sqrt[3]{3}}{3}$ $\left[=3^{\frac{4}{3}-1}\right]=3^{\frac{1}{3}}$ or $\sqrt[3]{3}=3^{\frac{1}{3}}$	**M1** **M1dep** **A1** **3 AO2.2**	$\frac{\sqrt[3]{81}}{3}=\frac{\sqrt[3]{81}}{\sqrt[3]{3^3}}$ $=\sqrt[3]{\frac{81}{27}}$ $=\sqrt[3]{3}=3^{\frac{1}{3}}$	In left-hand methods, **M1M1** can be awarded if the denominator 3 is consistently omitted There may be other surd methods. **M1** first productive step $\sqrt[3]{81}=81^{\frac{1}{3}}$ is not sufficiently productive as a first step **M1dep** second productive step from a correct first step Conversion to decimals scores **0**

Question			Answer	Marks	Part marks and guidance	
18	a		9.8[1…] nfww	**4** **1 AO1.3b** **2 AO3.1d** **1 AO3.3**	**M3** for $\sqrt{46^2+46^2+55^2}$ or 85.18 to 85.2 or $\sqrt{7257}$ OR **M2** for $46^2+46^2+55^2$ or 7257 or $\sqrt{46^2+46^2}$ or $\sqrt{4232}$ or 65.05 to 65.1 or $\sqrt{46^2+55^2}$ or $\sqrt{5141}$ or 71.7[…] OR **M1** for $46^2 + 46^2$ or 4232 or $46^2 + 55^2$ or 5141	Accept answers rounding to 9.8 if correct working seen Condone for full marks minor inaccuracies from rounding, such as $\sqrt{7256}$ seen May be done in steps
	b		40.2 nfww	**3** **1 AO1.3a** **2 AO3.1c**	**M2** for sin […] = $\frac{55}{their\ 85.18\ to\ 85.2}$ or tan […] = $\frac{55}{their\ \sqrt{46^2+46^2}}$ or cos […] = $\frac{their\sqrt{46^2+46^2}}{their\ 85.18\ to\ 85.2}$ OR **M1** for indication of required angle	Accept 40° and answers rounding to 40.2 if correct working seen **0** for tan […] = $\frac{55}{46}$ **M2** for cosine rule with cos as subject eg diagram showing angle

APPENDIX

Exemplar responses for Q3(a)(ii)

Response	Mark
(line drawn on graph) no, following the scatter diagram points there would be an estimate of around 240 visitors *Take "following the scatter diagram points" refers to the line and a supporting value*	**2**
no as with 1mm rain its 280 visitors so with 2mm you should get around 245 *B1 for 245 expected at 2mm but no reference to trend*	**1**
having drawn a line of best fit the scatter diagram wouldn't support this as it's too big a number *No explicit supporting value used*	**1**
no, by looking at the diagram you would expect about 240 *Supporting value in range but no justification*	**1**
no because with 1mm there's less than 320 visitors *1 mm and 320 are the supporting values but no reference to trend*	**1**
no because there were 320 visitors on a day with 0mm rainfall *0 mm and 320 are the supporting values but no reference to trend*	**1**
the scatter diagram doesn't support his statement as there isn't any rainfall that is 2mm *No supporting value*	**0**
no it doesn't because when the rainfall was 2mm he didn't have any visitors *Wrong*	**0**
the closest amount of visitors to 2mm of rainfall is 290 *An estimate that is out of range and is probably referring to the nearest point plotted. No reference to trend*	**0**
No we expect 250 (reference to line or markings drawn)	**2**
No, a line of best fit would show 250 (no line)	**2**
No we expect 250 (nothing else)	**1**
(No valid comment) line of best fit within overlay	**1**
OR	
No, 0-1 mm shows 320 but we would expect less as it is decreases/negative trend	**2**
No, 0-1 mm shows 320	**1**
No, 320 is for 1mm	**1**
No, negative trend	**1**
No, as on a day with 1mm there are fewer customers	**0**
OR	
No, (point below 2mm and point above 2mm stated) so there is a negative trend	**2**
No, (point below 2mm and point above 2mm stated)	**1**
Yes …	**0**

Exemplar responses for Q3(a)(iii)

Response	Mark
Outside range of data collected *Perfect!!*	**1**
because there is no data to show above 6mm of rainfall *Equivalent answer*	**1**
because the values of 7 and 8mm are not plotted, therefore it would be hard to estimate 9mm *Similar to "no data around 9mm"*	**0**
no record of any visitors are shown at 9mm of rainfall. Visitors stop coming when it hits 6mm of rainfall *Equivalent to "no data for 9mm"*	**0**
because there is not enough data to estimate the amount of visitors for 9mm of rainfall *Does not say "no data beyond 5.5 (or 6) mm"*	**0**
we don't have the data to do a line of best fit *Wrong*	**0**
there is nothing recorded *Wrong*	**0**
you can't plot this data the graph isn't big enough *Wrong*	**0**
because that would create an outlier or anomalous piece of data *Maybe but wrong*	**0**

Exemplar responses for Q3(b)

Response	Mark
The total number of visitors is not known *True*	**1**
there is no value of the amount of visitors that day *For value read number*	**1**
because there are more children and it **don't say how many there are in total** *Mark the best bit and no contradiction*	**1**
there is no numbers to help us find our answer *Too vague, could be referring to angles or number of adults*	**0**
the pie chart doesn't show any figures or percentages *Too vague, could be referring to angles or number of adults (and final part incorrect)*	**0**

they don't have enough information *Too vague*	**0**
because you can' tell what the percentage is *Wrong*	**0**
the tourist attraction could be aimed at children *Wrong*	**0**
its different every day *Wrong*	**0**
the pie chart is not as accurate as others *Wrong*	**0**

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