OCR
Oxford Cambridge and RSA

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GCSE (9–1)

Mathematics

J560/03: Paper 3 (Foundation tier)

General Certificate of Secondary Education

Mark Scheme for November 2020

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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.

1. Annotations available in RM Assessor. These **must** be used whenever appropriate during your marking.

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
BP	Blank page
SEEN	Seen

For a response awarded zero (or full) marks a single appropriate annotation (cross, tick, M0 or ^) is sufficient, but not required.
For responses that are not awarded either 0 or full marks, you must make it clear how you have arrived at the mark you have awarded and all responses must have enough annotation for a reviewer to decide if the mark awarded is correct without having to mark it independently.

It is vital that you annotate standardisation scripts fully to show how the marks have been awarded.

Subject-Specific Marking Instructions

2. **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.

3. 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 e.g. 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**.
- **soi** means **seen or implied**.
- **dep** means that the marks are **dependent** on the marks indicated. You must check that the candidate has met all the criteria specified for the mark to be awarded.
- **with correct working** means that full marks **must not** be awarded without some working. The required minimum amount of working will be defined in the guidance column and **SC** marks given for unsupported answers.

4. 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.

5. Unless the command word requires that working is shown and the working required is stated in the mark scheme, 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, i.e. incorrect working is seen and the correct answer clearly follows from it.

6. 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. 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.

   Figures or expressions that are being followed through are sometimes encompassed by single quotation marks after the word *their* for clarity, e.g. FT 180 × (*their* '37' + 16), or FT 300 – √(*their* '52 + 72'). Answers to part questions which are being followed through are indicated by e.g. FT 3 × *their* (a).

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

8. In questions **with a final answer line and incorrect answer given**:

   (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 if there is no other method leading to the incorrect answer. Use the **M0**, **M1**, **M2** annotations as appropriate and place the annotation **×** next to the wrong answer.

9. 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. A correct step, value or statement that is not part of the method that leads to the given answer should be awarded **M0** and/or **B0**.

   (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 marks for the poorer response unless the candidate has clearly indicated which method is to be marked.

10. 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 marks for the poorer response unless the candidate has clearly indicated which response is to be marked.

11. 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. If a candidate corrects the misread in a later part, do not continue to follow through, but award **A** and **B** marks for the correct answer only.

12. 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.

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

14. 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.

15. If in any case the mark scheme operates with considerable unfairness consult your Team Leader.

Question			Answer	Marks	Part marks and guidance	
1	a		One from 1, 2, 4, 10 or 20	1		If more than one, all must be correct
	b		Any multiple of 20	1		If more than one, all must be correct Answer 5 × 4 = 20 scores 0
2	a		25	1		
	b	i	12	1		
		ii	8	1		
3			Incorrect oe and [2 – 3 × 2 =] ⁻4 and [3 – 5 =] ⁻2	2	**B1** for [2 – 3 × 2 =] ⁻4 or 3 – 5 = ⁻2 or -2 associated with 3 – 5	Both answers are -2 scores B1 Incorrect because the answers are different scores 0
4	a		110	1		
	b	i	1	1		
	b	ii	Median [because] All but one score is close to 3 oe	1		Allow, it is not distorted by (the high value or 111) oe Accept 3 for Median Must mention or imply clustering or distortion See Appendix
5	a		Cylinder	1		Condone poor spelling
	b		[square-based] pyramid or octahedron	1		Condone poor spelling

Question			Answer	Marks	Part marks and guidance	
6	a		35	2	**M1** for 50 × 0.7 oe	Answer 35% implies **M1** For **M1** accept correct non-calculator methods that show operations See Appendix
	b		$\frac{7}{10}$ or equivalent fraction	2	**B1** for $\frac{3}{10}$ oe or answer 0.7 or 70%	**B1** may be implied by e.g.0.3 or $\frac{21}{70}$ etc but not × 3 ÷ 10
	c		Correct fraction	2	**M1** for common denominator of form 7*n* where *n* is integer > 1 or for 0.428[5...] and 0.571[4...] or 42.8[5...]% and 57.1[4...]% or $\left(\frac{3}{7}+\frac{4}{7}\right)\div 2$	For 2 marks, Ignore attempts to cancel once correct answer seen **but not** to change to decimal or percentage. May be 0.429 May be 42.9% Possible correct answers are $\frac{1}{2}$ or $\frac{7}{14}$ or $\frac{10}{21}$ or $\frac{11}{21}$ etc

Question			Answer	Marks	Part marks and guidance	
7			(-2, 4)	3	**B1** for [a length =] 6 soi **M1** for square or partial square anchored on (4, -2) and fitting entirely on the grid or two or three plots only that define a square anchored on (4, -2) or attempt $\begin{pmatrix} 4 \\ -2 \end{pmatrix} \pm \begin{pmatrix} 6 \\ 6 \end{pmatrix}$ If 0 scored, **SC1** for answer (-3, 5) or (-1, 3) or (0, 2) or (1, 1) or (2, 0) or (3, -1) or (5, -3)	e.g. line from A to (-2, -2) or (4, 4) At least two connected sides A suitable square side 6 anchored on (4, -2) scores **B1M1** Square need not be drawn some working to be seen for "attempt" e.g. 4 – 6 and −2 + 6

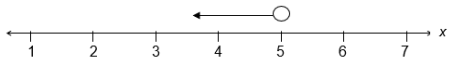
Question			Answer	Marks	Part marks and guidance	
8	a		18 515	4	**M3** for $7 \times 2300 \times 1.15$ oe or **M2** for 2300×1.15 oe soi 2645 or $7 \times 2300 \times 0.15$ soi 2415 or **M1** for 2300×0.15 oe soi 345 or 7×2300 soi 16 100	oe may be $\div 100$ and $\times 115$. If non calculator method then must see operations to award M unless implied by correct value. See Appendix
	b		7	3	**M2** for $63 \div 9$ OR **M1** $\frac{1}{10} : \frac{9}{10} = x : 63$ oe soi or **B1** for $\frac{9}{10}$ or 0.9 or 9 or 7 seen	Alternative: **M2** for $63 \div [0].9 - 63$ oe or **M1** for $63 \div [0].9$ oe For M1 Accept $1 : 9 = x : 10$
9			Incorrect oe supported by full correct evidence and $\frac{1}{3}$ or Incorrect oe supported by full correct evidence and $\frac{2}{3}$ not equal $\frac{2}{6}$ oe	3	**M2** for GB, GG, GR, RB, RG, RR oe only and $\frac{2}{6}$ or **M1** for 5 or 6 correct pairs shown [and one wrong or repeat] or [There are] six pairs [with] two matching [so P =] $\frac{1}{3}$" oe	oe correct, annotated tree diagram isw attempt to **cancel** once $\frac{2}{6}$ seen For **M1** ignore any fractions and mark only lists

Question			Answer	Marks	Part marks and guidance	
10			[Bank] A and 4 with correct working	5		Correct working requires at least M2
					M1 for 280 ÷ 250 soi 1.12 or 0.12	Accept 12% [of 250] seen.
					M1 for 400 × *their* 1.12 oe soi 448	oe 0.12 × 400 = 48, 400 + 48
					M1 for 452 – *their* 448	
					A1 dep for *their* A	**A1** for [Bank] A is dep **M3** *their* A is correct bank from identified 452 – *their* 448
					OR	ALTERNATIVE FORM OF METHOD
						Reduction to **common** amount ≠ 1 Marks only for e.g. 50 common
					M1 for 280 ÷ 250 soi 1.12	**M1** for 250 ÷ 5 and 280 ÷ 5 (**50**/56)
					M1 for 452 ÷ 400 soi 1.13	**M1** for 400 ÷ 8 and 452 ÷ 8 (**50**/56.5)
					M1 for (*their* 1.13 – *their* 1.12) × 400	**M1** for (*their* 56.5 – *their* 56) × 8
					A1dep for *their* A	**A1** for [Bank] A is dep **M3** *their* A is correct bank from identified (*their* 1.13 – *their* 1.12) × 400
					If 0 or **M1** scored, **SC2** for A and 4	If there is evidence for **M1** only and **SC2** is available, award only **SC2**
					or	
					If 0 scored, **SC1** for *their* A **and** wrong difference with subtraction seen	A value for A – a value for B seen or A value for B – a value for A seen

Question			Answer	Marks	Part marks and guidance	
11			$c = 2$ final answer $d = -3$ final answer	**5**	**B3** for $c = 2$ and **B2** for $d = -3$ OR **M4** for $5 + 2d = -1$ oe or **M3** for $10 + c = 12$ or $5 + cd = -1$ or $10x + cx = 12x$ or **M2** for $10x + 5 + cx + cd$ [$= 12x - 1$] oe or **M1** for $10x + 5$ or $cx + cd$	Must not come from wrong working Accept e.g. $d2$ or $2 \times d$ etc for $2d$ e.g. $10x + cx + cd = 12x - 6$
12	**a**	**i**	6	**1**		
		ii	-5	**1**		
	b		-1	**2**	**B1** for $1 = 2^0$ or **M1** for $2^y = \frac{1}{2}$ or $2^{1+y} = 2^0$ or $1 + y = 0$ or $2 \times 2^{-1} = 1$	**B1** Implied by $2 \times 2^y = 2^0$

Question			Answer	Marks	Part marks and guidance	
13	a		Straight line from (0, 0) with positive gradient	2	**B1** for straight line with positive gradient or a series of crosses in a straight line that would pass through (0, 0)	Intercept within 1 mm of (0, 0) ("centre of line" inside circle of overlay) For 1 or 2 marks, intended straight Ignore scale on axes At least three crosses
	b	i	36	3	**M2** for 432 ÷ 120 × 10 oe or **M1** for 432 ÷ 120 soi 3.6 or 120 ÷ 10 soi 12	e.g. 432 ÷ 12 120+120+120+60 = 420 oe
		ii	1640	3	**B1** for [2 kg =] 2000 seen **M1** for $100 \times \frac{\textit{their}\,36}{10}$ or 10 × *their* 36	**B1** may be awarded for the conversion even if not used in method May be 10 × *their* 36 correctly evaluated or 360 seen

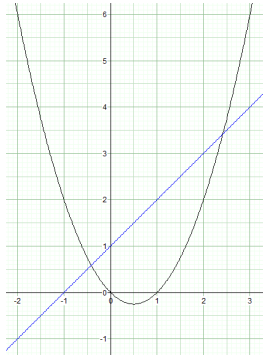
Question			Answer	Marks	Part marks and guidance	
14	a		Points plotted at (210, 130) and (100, 80)	2	**B1** for 100 soi or for one point plotted correctly	Half square tolerance May be implied by point plotted at duration 100
	b		Point at (220, 64) circled	1		
	c	i	Ruled line of best fit drawn	1		Use overlay anchored on top right point Line must reach to edges of overlay
	c	ii	*Their* line used to give duration for £90 ± 5 minutes	1 FT	Strict **FT** from their intended straight line of best fit	NB read (*n*, 90) not (90, *n*)
	d		[7 hours is] is beyond the given data oe	1		Accept eg the trend may not continue
15			16.5	4	**B3** for 5.5 [cm] nfww or **M2** for $3x + x + 3x + x = 44$ or better or $44 \div 8$ oe or **M1** for $3x$ [as length] and x [as width] or $4x$ [as length + width] or $8x$ [as perimeter] OR Using trial length and width with length = 3 × width **M1** for a perimeter found **M1** for a second perimeter closer to 44 If 0 scored **SC1** for answer 33	May be other letters or in words for 2 or 1 mark $3x$ and x may be on diagram

Question			Answer	Marks	Part marks and guidance	
16			$x < 5$ AND  	4	**B2** for $x < 5$ or **M1** for $3x < 19 - 4$ or better AND **B2FT** for $x < 5$, or *their* inequality, correctly shown or **B1** for $x < 5$, or *their* inequality, correctly shown with a hollow circle and wrong arrow **or** filled circle and correct arrow	Solution to inequality: Allow **M1** for this expression with other inequality symbols or equals sign or [x =] 5 as solution (can be implied by mark/circle on the diagram) or trials leading to selection of 5 or final correct trial using 5 Displaying the solution: Display must show an inequality that fits on the number line for FT Mark to candidate's advantage either $x < 5$ or *their* inequality Accept an arrow of any length or a line reaching 1 If no solution to inequality seen: Hollow circle at 5 arrow to left **M1B2** Filled circle at 5 arrow to left **M1B1** Hollow circle at 5 arrow to right **M1B1** Filled circle at 5 arrow to right **M1B0** Mark at 5 no line or arrow **M1B0** Circle and/or arrow at other than 5 **M0B0**

Question			Answer	Marks	Part marks and guidance	
17			2.25 nfww	5	**B2** for 36 or **M1** for $\frac{9\times 8}{2}$ AND **M2** for $\frac{1}{2}\times (12 + 20) \times h$ = *their* area of triangle oe or **M1** for $\frac{1}{2}\times (12 + 20) \times h$ oe	$8 \times 9 = 72$ then $72 \div (20 + 12) =$ 2.25 is wrong working May be in stages Allow (*their* area of triangle) ÷ 16 or better e.g. 36 ÷ 16 or72 ÷ 32 for **M2** **M**2 and **M1** may have area in stages e.g. $12h + \frac{8h}{2}$ (rectangle + one or two triangles) May be two trials approaching *their* area of triangle or one correct trial with 2.25 May be 16*h* or one trial with value for *h* substituted to attempt *their* area of triangle
18			5.39[6...] or 5.4[0]	3	**M2** for $8 \times \tan 34$ or any complete correct method or **M1** for $\tan 34 = \frac{x}{8}$	e.g. $\frac{8}{\tan(90-34)}$ e.g. $\tan(90-34) = \frac{8}{x}$ See appendix

Question			Answer	Marks	Part marks and guidance	
19	(a)		30 final answer	2	**B1** for 150 or 30 seen or **M1** for 360 ÷ 12 oe	e.g. $180 - \frac{180 \times 10}{12}$
	(b)		150 or **FT**(180 – **(a)**)	1		Only allow **FT** if 0 < *their* **(a)** < 180

Question			Answer	Marks	Part marks and guidance	
20			385 with correct working	**6**	**M2** for [mass of one panel =] 2.4 × 1.2 × 0.018 × 750 or 240 × 120 × 1.8 × 0.750 or **M1** for figs 24 × figs 12 × figs 18 × figs 750 or 2.4 × 1.2 × 0.018 or 240 × 120 × 1.8 AND **B1** for 15 000 [kg] or 15 000 000 g seen or *their* mass correctly converted to tonnes **M1** for $\frac{figs\ 15}{their\ mass}$ **A1** for 385.[…] to 387 If 0 or B1 scored instead award **SC2** for answer 385 with no or insufficient working or **SC1** for answer 385.[…] to 387 with no working	"Correct working" requires evidence of at least M2 AND B1 i.e. correct and consistent units used soi by 38.8 to 38.9 [kg] soi by 38 800 to 38 900 [g] soi by 0.0518 to 0.0519 [m^3] soi by 51 800 to 51 900 [cm^3] Assume *their* mass unit from **M2**, but do not assume from **M1** only Accept any figure **but not** 2.4, 1.2, 1.8 and 750 for *their* mass For **M1** accept one or more trial(s) of *their* mass × an integer in attempt to = *their* figs 15

Question			Answer	Marks	Part marks and guidance	
21	(a)		$\begin{pmatrix} 4 \\ -2 \end{pmatrix}$	2	**B1** for 1 component correct If **0** scored, **SC1** for $\begin{pmatrix} -4 \\ 2 \end{pmatrix}$ or $\begin{pmatrix} 4 \\ -2 \end{pmatrix}$ or (4. –2)	Penalise first appearance of vinculum or poor form in vector but condone second use
	(b)		$\begin{pmatrix} 1 \\ \frac{9}{4} \end{pmatrix}$ oe	2	**B1** for 1 component correct or $\begin{pmatrix} 4 \\ 9 \end{pmatrix}$ seen	
22	a		2 0	2	**B1** for each	
	b		Correct curve 	3	**B2FT** for all points correctly plotted or **B1FT** for 4 or 5 points correctly plotted	FT their values from the table in (a) for points but accept only the correct curve. Accuracy ± half small square Correct curve must have at least one square of daylight below *x*-axis at minimum point and not intended straight
	c		-[0].4 and 2.4	2	Correct answer or **FT** *their* graph for both **B1** for each	-0.45 to -0.35 and 2.35 to 2.45 FT from *their* line with half square accuracy (may be straight)

Question			Answer	Marks	Part marks and guidance	
23	a		0.12 oe isw	2	**M1** for 0.6×0.2	Ignore attempts to change form once correct answer seen. Accept 12% or $\frac{12}{100}$ or equivalent fraction
	b		0.6 oe isw	3	**M2** for $0.4 \times 0.3 + 0.6 \times 0.8$ or **M1** for 0.4×0.3 or 0.6×0.8	Accept 60% or equivalent fraction Ignore attempts to change form once correct answer seen. 0.12 could come from (a) so calculation must be seen for **M2** May be implied by 0.48

APPENDIX

Exemplar responses for Q4b(ii)

Response		Mark
Mode. It is the most common number of pets	Defines mode	**0**
Median It's the middle number	Defines median	**0**
Mean It would include all the numbers	Doesn't recognise distortion	**0**
3 We don't include 111 in the calculation. It's an anomaly	Doesn't mention distortion	**0**
Median It is a realistic figure	Doesn't say why it is realistic	**0**
Median [It's the more realistic average as] most pupils are closest to 3 than the rest	Implies clustering	**1**
3 Most of the numbers are near this	Accept 3 for Median (and imply Mode from 1)	**1**

Exemplar responses for Q6a

Non calculator methods.

Where non calculator methods are used then the full method must be seen to give M1
This either shows the operations being used at each stage or a complete description of the method with **correct values** at each stage. e.g.

$50 \div 10 = n$ $n \times 7$	$50 \div 100 = n$ $n \times 70$	100% → 50 1% → 0.5 ÷ 100 70% → 35 × 50	100% → **50** ✓ 1% → **0.5** ✓ 70% → **35** ✓	100% → **50** ✓ 1% → **0.05** × 70% → **0.35** ×
n can be incorrect but operations seen so **M1**	*n* can be incorrect but operations seen so **M1**	"→" may be "of 50" or "is" or "=" or missed out Values can be incorrect as operations seen. **M1**	"→" may be "of 50" or "is" or "=" or missed out Values **must be correct** as no operations seen: **M1**	"→" may be "of 50" or "is" or "=" or missed out Values **incorrect**. As no operations seen: **M0**

Exemplar responses for 8a

8a Non calculator methods. e.g.

$2300 \div 100 = n$ $n \times 115$ (or $2300 + n \times 15$)	$2300 \div 100 = n$ $n \times 15$	100% → 2300 1% → 23 ÷ 100 115% → 2645 × 115	100% → 2300 1% → 23 15% → 345 115% → 2300 + 345	100% → 2300 1% → 2**5** 15% → 3**75** 115% → 2**675**
n can be incorrect but operations seen so **M2**	*n* can be incorrect but operations seen so **M1**	"→" may be "of 2300" or "is" or "=" or missed out Values can be incorrect as operations seen. **M2**	"→" may be "of 2300" or "is" or "=" or missed out Values **must be correct** as no operations seen: **M2** If stopping at line 3 or next step incorrect then **M1**	"→" may be "of 2300" or "is" or "=" or missed out Values **incorrect**. As no operations seen: **M0**

If a candidate successfully demonstrates a step in the method the marks are awarded, even if they then misuse the step

However, if the method is embedded in other, wrong steps, so there is no clear step shown from the scheme, the mark is not awarded.

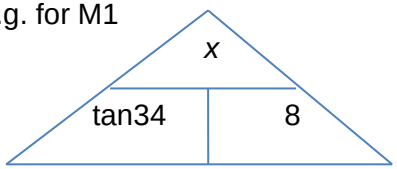
Exemplar responses for Q10

Response	Mark
ALTERNATIVE METHOD	
M1 for $250 \div 5 =$ **50** and $280 \div 5 = 56$ **M1** for $400 \div 8 =$ **50** and $452 \div 8 = 56.5$ **M1** for 0.5×8 This is fine as the two amounts are reduced to a common amount of **50**	**3**
M0 for $250 \div 5 =$ **50** and $280 \div 5 = 56$ **M0** for $400 \div 10 =$ **40** and $452 \div 10 = 45.2$ **M0** for $(45.2 - 40) \times 10$ This scores no marks as the amounts reduced to are **not** common. We must consider the whole method to be able to award marks	**0**

Exemplar responses for Q14d

Response	Mark
No because it does not have a record for 7 hours This scores 0 as there is no record for e.g. 80 min. Must imply “beyond”	0
7 hours isn't on the scale. No. Implies a bigger diagram would be OK	0
No Because 420 minutes is too long to fit on the graph Implies it would be OK with a bigger graph	0
No It only shows 2h 50 minutes Suggests 7 hours is a missing value	0
No It would go up to 4200. No. Implies scale not long enough	0
No Highest duration is 250 mins which isn't 7 hours. 420 mins is 7 hours. No. Implies a bigger diagram would be OK	0
No His records only go up to 4hours 10minutes. No. This is about the scale. However, if they had said 4 hours, then they would have been talking about the data	0
No It does not show this information. 7x60 = 420mins. Graph only goes up to 250 mins. No...scale again	0
No His record doesn't show any 7 hour flights. No. Implies it is a missing value	0
No It would not fit on the graph. No. Implies a bigger diagram would be OK	0
No Duration only goes to 250 mins. No. Implies a bigger diagram would be OK	0
No Graph does not go beyond 250 minutes. 60x7 = 420mins. No. Implies a bigger diagram would be OK	0
No Extrapolation Not explained	0
No. The data only shows a maximum of a 250 minute flight so this would be unreliable Contradiction. 240 rather than 250 would have been acceptable.	0
No. Should not extrapolate beyond 250 minutes/the graph Graph not big enough	0
No. Extrapolating too far meaning his estimate would be inaccurate Not quite sufficiently clear. What is “too far” and is it from 240 or 250?	0
No Duration does not go up to 7 hours. No. Implies a bigger diagram would be OK	0
No There are only less amount of flights on the diagram. Yes. This implies “beyond the data”	1
No because the duration only goes up to 240 minutes Scores the mark for implying beyond the data	1
No because it does not have records that go as far as 7 hours. This is OK as it implies “beyond”	1
No. Should not extrapolate beyond 240 minutes/the data Beyond the data	1

Exemplar responses for Q18

Response	Mark
For longest method **M1** is for step before explicit calculation for answer $\cos 34 = \frac{8}{y}$ so $y = \frac{8}{\cos 34}$ so $x^2 = \left(\frac{y}{\cos 34}\right)^2 - 8^2$	**M1**
For longest method **M2** is for explicit calculation for answer $\cos 34 = \frac{8}{y}$ so $y = \frac{8}{\cos 34}$ so $x = \sqrt{\left(\frac{8}{\cos 34}\right)^2 - 8^2}$	**M2**
Allow e.g. for M1  	**M1**

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