Foundation

GCSE

Mathematics - Paper 2

J560/02: Paper 2 (Foundation tier)

General Certificate of Secondary Education

Mark Scheme for June 2022

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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.

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MARKING INSTRUCTIONS

PREPARATION FOR MARKING
RM ASSESSOR

1. Make sure that you have accessed and completed the relevant training packages for on-screen marking: *RM Assessor Online Training*; *OCR Essential Guide to Marking*.

2. Make sure that you have read and understood the mark scheme and the question paper for this unit. These are available in RM Assessor.

3. Log-in to RM Assessor then mark and annotate the **required number** of practice responses ("scripts") and the **required number** of standardisation responses.

MARKING

4. Mark strictly to the mark scheme.

5. Marks awarded must relate directly to the marking criteria.

6. The schedule of dates is very important. It is essential that you meet the RM Assessor 50% and 100% deadlines. If you experience problems, you must contact your Team Leader (Supervisor) without delay.

7. If you are in any doubt about applying the mark scheme, consult your Team Leader via the RM Assessor messaging system.

8. Where a candidate has crossed out a response and provided a clear alternative then the crossed out response is not marked. Where no alternative response has been provided, examiners should give candidates the benefit of the doubt and mark the crossed out response where legible.

9. When a candidate provides contradictory responses, then no mark should be awarded, even if one of the answers is correct.

10. On each blank page the annotation **BP** must be inserted to confirm that the page has been checked. For additional objects (if present), a tick must be inserted on each page to confirm that it has been checked.

11. There is a NR (No Response) option. Award NR (No Response)
    - if there is nothing written at all in the answer space
    - OR if there is a comment which does not in any way relate to the question (e.g. 'can't do', 'don't know')
    - OR if there is a mark (e.g. a dash, a question mark) which is not an attempt at the question.

    The hash key (#) on your keyboard will enter NR.

    Note: Award 0 marks for an attempt that earns no credit (including copying out the question).

12. The RM Assessor **comments box** is used by the Principal Examiner or your Team Leader to explain the marking of the practice responses. Please refer to these comments when checking your practice responses. **Do not use the comments box for any other reason.**

    If you have any questions or comments for your Team Leader, use the RM Assessor messaging system.

13. Assistant Examiners should send a brief report on the performance of candidates to their Team Leader (Supervisor) by the end of the marking period. Please follow the direction of your Team Leader about which questions you should report on and how to submit your report. Your report should contain notes on particular strengths displayed as well as common errors or weaknesses.

14. 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

15. **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.

16. 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.

17. 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.

18. 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.

19. 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).

20. 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'.

21. 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.

22. 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.

23. 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.

24. 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.

25. 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.

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

27. 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.

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

Question			Answer	Marks	Part marks and guidance	
1	(a)	(i)	-1	1		
	(a)	(ii)	-6	1		
	(a)	(iii)	$\frac{3}{7}$	1		
	(a)	(iv)	$\frac{3}{4}$	1		Accept [0].75 Accept an equivalent fraction but do not accept $\frac{1.5}{2}$
	(b)		5	2	**B1** for answer 2 or 3 or 5 with one or both other prime numbers.	e.g. B1 for 2 x 3 x 5
2	(a)		$\frac{2}{3}$	1		Condone $\frac{2k}{3k}$
	(b)		75	1		
	(c)		$\frac{1}{5}$ final answer	2	**M1** for $\frac{2}{10}$ or an equivalent fraction After 0 scored, **SC1** for their fraction written in simplest form	SC1 dep on a fraction that simplifies
	(d)		24	2	**M1** for 0.8 × 30 or 3 × 8 oe After 0 scored, **SC1** for 24%	Allow M1 for complete attempt at "chunking" e.g., 10% = 3 [repeated 8 times] oe

Question			Answer	Marks	Part marks and guidance	
3			8	2	**M1** for any valid complete method e.g., 100 ÷ 25 × 2 oe soi by 4 × 2 or 200 ÷ 25	For M1 accept 25, 50, 75, … [up to] 200 or 200, 175, 150 … [down to] 0 with one arithmetic slip condoned
4	(a)		$\frac{1}{8}$	1		In (a) and (b) accept equivalent fractions, decimals or %'s with the % sign Isw attempts to convert after correct answer seen Do not accept ratio or words
	(b)		$\frac{3}{8}$	2	**M1** for 12, 15, 18 chosen	For M1 12, 15, 18 may be circled or underlined – intention that only these 3 numbers selected must be clear
5			2 : 3 final answer	2	**B1** for any ratio equivalent to 5 : $7\frac{1}{2}$ except 5 : 7.5 and 5 : $\frac{15}{2}$	2 marks for 1 : 1.5 or 1 : $\frac{3}{2}$ or $\frac{2}{3}$: 1 For B1 isw
6	(a)		Correct bar at 54	1		Accept clear intention but do not accept a vertical line to 54
	(b)		No, not true with valid supporting reason	1		e.g. 100% being the same as all students absent oe e.g. percentage cannot be greater than 100% <u>in this context</u> oe If values are used, they must be correct Any incorrect statement invalidates the mark See Appendix

Question			Answer	Marks	Part marks and guidance	
	(c)		7	**3**	**M2** for $\frac{42}{600}$ × 100 oe or **M1** for $\frac{42}{600}$ oe or $\frac{n}{600}$ × 100 oe	e.g. 42 ÷ 6 $n < 60$
7	**(a)**		$5x + 10$ final answer	**1**		
	(b)		$r = \frac{p+5}{3}$ or $r = \frac{p}{3} + \frac{5}{3}$	**2**	**M1** for $p + 5 = 3r$ or for $\frac{p}{3} = r - \frac{5}{3}$ or for answer $\frac{p+5}{3}$ or $\frac{p}{3} + \frac{5}{3}$ or for correct step to answer after incorrect first step shown	
8	**(a)**	**(i)**	3.9[0]	**1**		
	(a)	**(ii)**	[0].7	**1**		
	(b)		0.45	**3**	**B2** for figs 45 in final answer or 1.5 oe nfww or (2.1 – *their* $\frac{3}{5}$) × 0.3 evaluated accurately or *their*(2.1 – 0.6) × 0.3 evaluated accurately or **B1** for [$\frac{3}{5}$ =] 0.6 or (2.1 – *their* $\frac{3}{5}$) evaluated accurately or the result of *their*(2.1 – *their* $\frac{3}{5}$) × 0.3 evaluated accurately	i.e. **B2** for two accurate processes or **B1** for one accurate process

Question			Answer	Marks	Part marks and guidance	
9			225	4	**B1** for 20 [adults] and **M2** for 50 × 2.5 + (*their* 20) × 5 soi or **M1** for 50 × 2.5 or (*their* 20) × 5	For M2 and M1 *their* 20 must be an integer The addition may be implied by *their* answer May be implied by 125 May be implied by *their* 100
10			44.95 with correct working	6	**M1** for $\frac{1}{2}$ × 20 × 15 oe **A1** for 150 **M1** for *their* area ÷ 35 soi by 4.2... to 4.3 or repeated addition of 35 to at least 140 or to the multiple of 35 below *their* area oe **A1FT** for [number of bags =] 5 or *their* area ÷ 35 rounded up to an integer **M1** for *k* × 8.99 **A1FT** for 44.95 or *k* × 8.99 evaluated correctly If 0 or **M1** scored, instead award **SC2** for answer 44.95 with no or insufficient working.	correct working requires evidence of at least **M1M1** 150 implies M1A1 From an area, not a perimeter or length Allow 1 arithmetic slip in their list May be implied by their final calculation of cost Where *k* is an integer but not *k* = 1 or 10 Mark the calculation that leads to their final answer

Question			Answer	Marks	Part marks and guidance	
11	(a)		Correct, labelled pie chart with correct working	6		"correct working" requires at least **M1M1 and ruled line** If there are labelled angles, mark the method that leads to the angles If angles are not shown mark worst method
					M2 for 360 – (160 + 60 + 20) oe or **M1** for 160 + 60 + 20	May be implied by 120 May be implied by 240
					AND	
					M1 for $\frac{2}{5}$ × *their* 120 oe **A1** for 48 or **M1** for $\frac{3}{5}$ × *their* 120 oe **A1** for 72	Mark to the candidate's advantage *Their* 120 < 360 48 implies M1A1 72 implies M1A1
					AND	
					B1 for ruled line at 48˚	Tolerance ± 2˚ only if correct working seen.
					B1 for *their* smaller sector labelled "bike" and larger sector labelled "car"	
	(b)		Bus	1		

Question			Answer	Marks	Part marks and guidance	
12	(a)		Correct comment about large numbers or too many zeros oe	1		e.g. Standard form is used for [very] large/long numbers [or very small numbers] Writing out all the zeros may lead to errors See Appendix
	(b)		1.7×10^8	3	**M2** for figs 17 in final answer or **B1** for 240 000 000 or 70 000 000 or 24 x 10^7 or 0.7 x 10^8 or **M1** for $2.4 \times 10^8 - 7 \times 10^7$ oe	Accept both converted to same power of 10 e.g. 240×10^6 and 70×10^6 For M1, if standard form subtraction written correctly, isw incorrect conversion to values
13	(a)		4	1		
	(b)		28	2	**B1** for answer that is a multiple of 7 (not 7 or 14) but not a multiple of 49 and is less than 784 or $n \times 7$ seen leading to the answer	28 scores 2 marks from any method Allow B1 for a correct equivalent to 28 of form $a\sqrt{b}$ ($a \neq 1$) e.g. $7\sqrt{16}$, $4\sqrt{49}$, $2\sqrt{196}$ $n = 2^k$ where k is an integer > 1

Question			Answer	Marks	Part marks and guidance	
14						For each statement marks spoilt if extra transformations For each statement treat extra descriptors as choice Mark statement 1 and 2 independently unless a single transformation is described across the entire answer space
			Translation	**1**		
			$\begin{pmatrix} 5 \\ -4 \end{pmatrix}$	**2**	or 5 right and 4 down **B1** for each component of the vector or 5 right or 4 down or **SC1** for $\begin{pmatrix} 5 \\ -4 \end{pmatrix}$ or $\begin{pmatrix} -4 \\ 5 \end{pmatrix}$	Condone omission of brackets Do not allow a coordinate
			Rotation	**1**		
			180[°] [clockwise/anticlockwise]	**1**		
			[Centre] (0, -2)	**1**		Condone omission of brackets Allow **1** for [negative] enlargement **1** for scale factor -1 **1** for [centre] (0, -2)

Question			Answer	Marks	Part marks and guidance	
15			5	3	**B1** for $y = \frac{k}{x}$ oe soi by $20 = \frac{k}{3}$ or $k = 60$ **M1** for [y =] $\frac{their\ k}{12}$ OR **M2** for $20 \times 3 = y \times 12$ or better or **M1** for 20 x 3 **Alternative method:** **M2** for $20 \div (12 \div 3)$ or **M1** for $12 \div 3$ If 0 scored **SC1** for answer of 80	e.g. for 2 marks $\frac{60}{12}$ oe Implied by 60 May be seen in a table: **M2** for × 4 oe and ÷ 4 oe or **M1** for × 4 oe × 4 x | 3 | 12 y | 20 | ÷ 4
16	(a)		$x + 140$	1		
	(b)		210 nfww	4	**B1** for $3x$ **M1** for $3x =$ *their* $(x + 140)$ **A1FT** for $x = 70$	*their* $(x + 140)$ cannot be numeric and must lead to an equation that can be solved when equated to $3x$ eg if *their* $(x + 140)$ is $3x$ then M0 FT correctly solving *their* linear equation in x

Question			Answer	Marks	Part marks and guidance	
17	(a)		[0].12 oe	2		Accept e.g. 12%, 12/100 oe
					M1 for 1 – (0.08 + 0.42 + 0.38) oe	M1 implied by 1 – 0.88
	(b)		154 [points]		**B3** for 154 or 118 + 3 × *their* 0.12 × 100 correctly evaluated or	
			and	**4FT**	**M2** for [0.08 × 0 × 100 +] ([1 ×] 0.42 × 100) + (2 × 0.38 ×100) + (3 × *their* 0.12 × 100) or better or **M1** for 2 × 0.38 **and** 3 × *their* 0.12 **or** for one of ([1×]0.42 × 100), (2 × 0.38 × 100), (3 × *their* 0.12 × 100)	**M2** for full method implied by 42 + 76 + 36 or 1.54 × 100 **M1** implied by [0].76 and [0].36 or 1.54 or one of 42, 76, 36
			No/Morgan is not correct oe		**FT dep** on B3 for correct conclusion from *their* 0.12	For conclusion accept e.g. 154 and No, 154 < 160 If FT from e.g. 0.22 in (a) then 184 and yes gets 4FT

18			60 with correct working	**5**	**M4** for 36 × $\frac{5}{3}$ oe or 9 × $\frac{20}{3}$ oe or 27 × $\frac{20}{9}$ oe or 24 × $\frac{5}{2}$ oe or **M3** for $\frac{2}{5} + \frac{9}{n} + \frac{3\times9}{n}$ [= 1] oe or $\frac{3}{5} = \frac{9+3\times9}{n}$ oe or $\frac{1}{4}$ of $\frac{3}{5} = \frac{9}{n}$ oe or $\frac{3}{4}$ of $\frac{3}{5} = \frac{3\times9}{n}$ oe or **M2** for $\frac{3\times9}{n} + \frac{9}{n}$ oe or **M1** for $\frac{3\times9}{n}$ oe **OR** **M2** for [no. of B + Y =] 9 + 3 × 9 oe or **M1** for [no. of B =] 3 × 9 oe **B2** for no. of red = 24 or **M1** for ratio of R : B + Y = 2 : 3 oe **OR** **M2** for [no. of B + Y =] 9 + 3 × 9 oe or **M1** for [no. of B =] 3 × 9 oe **M1** $\frac{3}{5}[n]$ is 9 + 3 × 9 oe **A1** $\frac{1}{5}[n]$ is 12 oe If 0 or **M1** scored, instead award **SC2** for answer 60 with no or insufficient working. If 0 scored, **SC1** for $\frac{1}{5}[n]$ oe is 12 with no working.	"correct working" requires at least **M2** M4 for any fully correct method e.g. For M3 accept e.g. $\frac{3}{5}$ = 36, $\frac{3}{20} = 9$, $\frac{9}{20}$ = 27 or $\frac{2}{5} = 24$ oe, $x = \frac{3}{20}$ oe (where x is probability of Y) M2 for $3x + x = \frac{3}{5}$ oe (from x = P(Y)) M2 implied by [no. B + Y =] 9 + 27 or 36 M1 for e.g. R = $\frac{2}{5}$, B + Y = $\frac{3}{5}$ M2 implied by [no. B + Y =] 9 + 27 or 36 May work in equivalent decimals or percentages e.g. 60% is 36, 20% is 12

Question			Answer	Marks	Part marks and guidance	
19	(a)		$\frac{1}{2}$	1		
	(b)		12	2FT	**B2FT** for final answer $12\sqrt{3}$, 8, $8\sqrt{3}$ or 6 if consistent with *their* (a) or **M1** for $24 \times \frac{1}{2}$ or 24 × *their* (a)	For 1 or 2 marks, isw attempts to simplify the surds May be implied by their answer Ignore units
20			$y = 2x - 18$ with correct working	5	**M1** for attempt at $\frac{change\ in\ y}{change\ in\ x}$ **A1** for '*m*' = 2 **M1** for 0 = *their* '*m*' × 9 + '*c*' or $^{-}6$ = *their* '*m*' × 6 + '*c*' or for $\frac{9}{3}$ × [±]6 oe **A1** for '*c*' = $^{-}18$ If 0 scored, **SC1** for implying the y intercept is -18 with no or insufficient working, may be seen on the diagram or for D is (6, -6)	'correct working' requires evidence of at least **M1M1** or **M1A1** may be implied on the diagram or may be implied by -2 **M1A1** soi by ['*m*' =] 2 Allow FT from D or *their* D stated may be implied on the diagram

Question			Answer	Marks	Part marks and guidance	
21	(a)		$x^2 + 4x + 3x + 12$ [$= x^2 + 7x + 12$]	**M1**		May be seen in the work space or within their statement and it might be seen in e.g. a table where the addition can be implied
			Ellis with a correct statement about definition of an identity or of an equation or Ellis with correct supporting work and statement	**B1**		e.g. an identity is true for all values of x or e.g. this cannot be solved to get a value of x or e.g. left-hand side is the same as the right-hand side Accept "neither, because if it was an identity then it would have ≡" See Appendix
					<u>Alternative Method</u> **M1** for shows LHS = RHS for at least three values of x **B1 dep** for Ellis with *their* correct statement e.g. a quadratic equation does not have three solutions [so by elimination it is an identity]	

Question			Answer	Marks	Part marks and guidance	
	(b)		$(x + 6)(x - 2)$	**M2**		For M2 or M1 condone omission of final bracket
					M1 for $(x + a)(x + b)$ where $a + b = 4$ or $ab = -12$ or for $x + 6$ [= 0] and $x - 2$ [= 0]	e.g. $(x + 1)(x + 3)$ as $a + b = 4$ or e.g. $(x - 3)(x + 4)$ as $ab = -12$
			-6 and 2 final answer	**B1FT**	**strict FT** for correct solutions from *their* quadratic factors If 0 scored **SC1** for answer ±2 and ±6	e.g. FT $x = -1$ and $x = -3$ from $(x + 1)(x + 3)$
22			Accurate ruled angle bisector with two pairs of supporting arcs isw	**B2**	**B1** for accurate angle bisector at least 2 cm long with no/incorrect arcs isw	Use overlay as a guide, bisectors should lie within or on the lines For **B2** allow use of the arc around A as one pair – at least 2 cm long for B2 Tolerance ±2˚
			Accurate ruled perpendicular bisector with two correct pairs of intersecting arcs isw	**B2**	**B1** for accurate perpendicular bisector at least 2 cm long with no/incorrect arcs isw	Tolerance ±2° and ±2 mm At least 2 cm long for B2 but must remain in tolerance if extended within shape for B1 and B2
			2 correct regions shaded/clearly indicated with no extras	**B2 dep**	Dep on at least **B1B1** **B1dep** for 1 correct region with no extras or 2 correct regions and one extra	**B1dep** on B1 for angle bisector for region bounded by angle bisector or dep on **B1B1** for region bounded by both bisectors and arc See Appendix for solution

APPENDIX

Exemplar responses for Question 6b

	Response	**Mark**
1	No because 100% means everyone	1
2	No that would be all of the students and more (*this would also score if they hadn't stated 'and more'*)	1
3	No There can only be 100% of the students	1
4	No it is over 100% meaning all of them would be absent	1
5	No 150% means all students would be absent (*we can condone use of 150% as 'all would be absent'*)	1
6	This could not be true as not everyone was absent (*could not be true is fine to imply 'no'*)	1
7	This could not be true as 150% is 1.5 times more students which is impossible (*BOD 'more')*	BOD 1
8	No it cannot because 150% is more than the total which isn't possible (*BOD 'total' implies students*)	BOD 1
9	No, that is more students than there is in the school (*BOD a % rather than 150 as there are 600*)	BOD 1
10	No because how can more than 100% be absent (*the word absent is referring to the context*)	BOD 1
11	No because only 50 students were absent (*needs reference to all or less than 100%)*	0
12	No because 150% of all students would be 90 and there are only 50 absent (*should be 900*)	0
13	No because it's less than the number of people in the school (*interpreted as 150 rather than 150%*)	0
14	No, 50/600 isn't 150% (*true but doesn't answer the question with reference to 150% >100%*)	0
15	No this could not be true as 100% is all the students. There were 10 students still at school on Monday (*The 1st sentence alone would score, but the additional incorrect statement loses the mark*)	0
	All of the following score 0 as they do not refer to the context of the question	
16	No, it could only be out of 100%	0
17	No because the percent is out of 100	0
18	No because 150% is impossible	0
19	No because 50 is half of 100 so it wouldn't be above 150%	0
20	No there should always be 100%	0

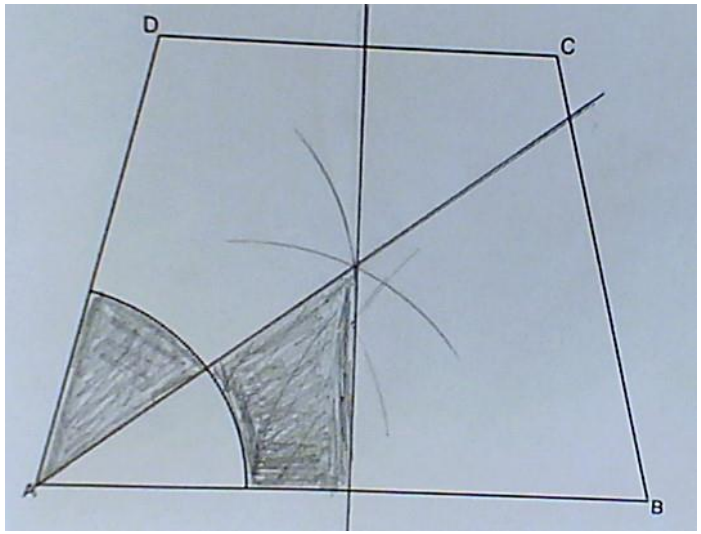
Exemplar responses for Question 12a

	Response	Mark
1	Writing all the 0's out is very long/difficult to read/may lead to errors	1
2	As they contain a lot of 0s	1
3	Because there are too many zeros	1
4	Because the numbers are extremely long/high/large, shortening the number.	1
5	Because of how long/high/large the number will be	1
6	The numbers are too long to write down e.g. $7 \times 10^7 = 70\,000\,000$	1
7	It shortens the numbers due to them having so many 0s	1
8	Because they're too big *(Given the wording of the demand – refers to numbers)*	1
9	It takes too long to write it all out	1
10	Because the digits will be too long *(BOD infers numbers are too long)*	BOD 1
11	Wastes time writing out the digits, this is simple shorthand *(similar to above)*	BOD 1
12	To makes it easier to read *(no reason given as to why)*	0
13	To make the numbers more simpler *(no reason given e.g. numbers too large, too many zeros)*	0
14	Its easier to understand *(no reason given as to why)*	0
15	Because otherwise you need to write 2.4 billion years ago so 2.4×10^8 is easier to say in standard form *(Contains error in number, if 240 million years this would be OK)*	0
16	Because the numbers are billions so it's easier to read them in standard form *(see above)*	0
17	It shortens the numbers *(no reason given why e.g. too large, too many zeros)*	0

Exemplar responses for Question 21a

	Response for the B marks	Mark
1	Ellis – the expression before and after the equal sign are the same (*'same' implies identical in form*)	**1**
2	Ellis – $(x + 4)(x + 3)$ is the same as $x^2 + 7x + 12$	**1**
3	Ellis – the statement in the box doesn't gives a value, an equation would be to find a specific number	**1**
4	Identity – $(x+4)(x+3)$ has the same answer expanded as $x^2 + 7x + 12$ (*condone identity instead of Ellis*)	**1**
5	Ellis – they are written differently but are equal to the same (*this is ok to score as they have clarified that the 2 sides are the same but in different forms*)	**1 BOD**
6	Ellis – $(x + 4)(x + 3)$ is equal $x^2 + 7x + 12$ when expanded	**0**
7	Ellis there is nothing to work out (*not enough*)	**0**
8	Ellis – it is identifying how each formula is equal to each other (*equal to each other is not enough*)	**0**
9	Ellis – you're not asked to work anything out, it gives you the answer (*they say you're not asked to work it out rather than saying it cannot be solved*)	**0**

Correct answer for Question 22



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