GCSE

Mathematics

Unit **J560/01**: Foundation Tier Paper 1

General Certificate of Secondary Education

Mark Scheme for November 2017

1. 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

These should be used whenever appropriate during your marking.

The **M**, **A, B** etc annotations must be used on your standardisation scripts for responses that are not awarded either 0 or full marks.
It is vital that you annotate these scripts to show how the marks have been awarded.
It is not mandatory to use annotations for any other marking, though you may wish to use them in some circumstances.

Subject-Specific Marking Instructions

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

3.   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 <u>not from wrong working</u> **full marks** should be awarded.

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

4.   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 – √(*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.

5.   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.

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

-   **cao** means **correct answer only**.
-   **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).
-   **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**.

7.   Make no deductions for wrong work after an acceptable answer unless the mark scheme says otherwise, indicated for example by the instruction 'mark final answer'.

8. As a general principle, if two or more methods are offered, mark only the method that leads to the answer on the answer line. If two (or more) answers are offered, mark the poorer (poorest).

9. 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.

10. 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.

11. If the correct answer is seen in the body and the answer given in the answer space is a clear transcription error allow full marks unless the mark scheme says 'mark final answer' or 'cao'. Place the annotation ✓ next to the correct answer.

    If the answer space is blank but the correct answer is seen in the body allow full marks. Place the annotation ✓ next to the correct answer.

    If the correct answer is seen in the working but a completely different answer is seen in the answer space, then accuracy marks for the answer are lost. Method marks would still be awarded. Use the M0, M1, M2 annotations as appropriate and place the annotation ✗ next to the wrong answer.

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.

Question			Answer	Marks	Part marks and guidance	
1	(a)		Trapezium	1		
	(b)		6	1		
2	(a)	(i)	Any multiple of 13	1		Allow 13
		(ii)	41, 43 or 47	1		
	(b)		112	2	**B1** for any common multiple of 16 and 28 or one complete, correct list of multiples leading to 112 or $2^4 \times 7$	16,32,48,64,80,96,112 or 28, 56, 84,112
3	(a)	(i)	7900	1		
		(ii)	8000	1		
	(b)		7	1		Do not allow 3^7
4	(a)	(i)	=	1		
		(ii)	<	1		
		(iii)	<	1		
	(b)		$x > 2$	1		Allow $2 < x$
5			$\frac{7}{26}$　28%　2.7	2	**M1** for either 0.28 or $\frac{7}{25}$ from 28% or 0.26[9…] or 0.27	
6	(a)	(i)	$4p$	1		
		(ii)	$5j - 2k$	2	**B1** for $5j$ or $-2k$ in final answer	
	(b)		144	2	**M1** for 120 or 24 or $10 \times 12 + 6 \times 4$	Not 120h or 24t
	(c)		$d = \dfrac{f - e}{7}$ oe nfww	2	**M1** for correct first step or $\dfrac{f - e}{7}$	$e + 7d = f$ or $e - f = -7d$ oe
7			0.38 oe	2	**M1** for $1 - (0.4 + 0.05 + 0.17)$	If answer line blank check table $\frac{0.38}{1}$ scores **M1**
8	(a)		52	1		

	Question		Answer	Marks	Part marks and guidance	
	(b)		60 8 12 3	4	**B1** for each correct value OR **B1** for 60 **B1 FT** for 12 **B1 FT** for 8 and 3	Answers must be integers Mark to candidate's advantage
	(c)		Practical test because 61 > 60 (Comparison explicitly seen)	3	**B1** for 61 or 52+9 or 84.7[2…]% or 85% [for practical] **B1FT** for *their* 60 or *their* 83[.3..]% [for theory] **B1FT** for correct conclusion based on *their* figures in the table, must see comparison	Accept denominator of 72 **FT** from their diagram, must give numerical values
9			Correct enlargement (6, 3) (12, 3) (12, 9) (9, 12) (6, 9)	3	**B2** for correct enlargement incorrect centre or enlargement scale factor 2 from correct centre OR **M1** for 3 points correctly plotted	Condone good freehand
10	**(a)**		12.4	3	**M2** for 62 ÷ 500 × 100 oe OR **M1** for 62 ÷ 500	
	(b)		213.64	3	**M2** for 1.09 × 196 oe OR **M1** for 0.09 × 196 oe soi by 17.64	If non calculator method, it must be fully correct

Question	Answer	Marks	Part marks and guidance	
11	6	4	**B3** for 3 and 2.25 or for 5.25 OR **M1** 360 ÷ 15 soi by 24 **M1** 1440 ÷ 80 soi by 18 **M1** *their* 24 ÷ 8 and *their* 18 ÷ 8 or *their* (24 + 18) ÷ 8 OR **M1** for 15 × 8 soi by 120 **M1** for 80 × 8 soi by 640 **M1** for 360 ÷ *their* 120 and 1440 ÷ *their* 640	Accept equivalent alternative methods
12	6000	4	**B3** for 1125, 1875 and 3000 OR **M3** for 750 ÷ 2 × *their* (3+5+8) OR **M2** for 750 ÷ 2 × 3 or 750 ÷ 2 × 5 or 750 ÷ 2 × 8 OR **M1** for 750 ÷ 2 soi by 375 If **0** scored **SC2** for 750 +1250 + 2000 = 4000 or 450+ 750 +1200 = 2400 OR **SC1** for 750 ,1250 ,2000 or 450, 750, 1200 OR **SC1** for [Leo] x [Kush] x + 750 [Mai] $2x$ + 750 and totals to $4x$ + 1500	

	Question		Answer	Marks	Part marks and guidance	
13	(a)		20	1		
	(b)		60	2	**M1** for 50 miles in 50 min oe 50/50[x 60]	
	(c)		Line from (1310, 120) to (1420, 180)	2	**B1** for line from (1310, 120) **B1** for line to (1420, 180)	Extra stop allowed A non-decreasing curve is OK
14			12, 36, 14	6	**B1** for one of [Gugu] 3x or [Deanna] x+2 **M1** for 52.7 ÷ [0.]85 oe soi by figs 62 **M1** for $x + 3x + x + 2$ **M1ft** for 5x = 60 **A1** for x =12	
15	(a)		⁻1 [⁻4] [⁻5] [⁻4] ⁻1 4 [11]	2	**B1** for 1 correct	
	(b)		Correct curve	2	**B1** for 4 or more points correctly plotted FT *their* table	Tolerance half small square
	(c)		Ruled line $y = -2$ drawn	1		Line from x = -2 to x =2
	(d)		-1.8 to -1.6 and 1.6 to 1.8	2	**B1** for 1 correct	**FT** from *their* graph ± 0.1 for 2 or 1 mark Must have a curve and a straight line for FT

Question			Answer	Marks	Part marks and guidance	
16	(a)		93 ÷ 3 or 31 or 100 ÷ 3 or 33.3.. or 55 ÷ 1.55 or 3300 ÷ 93 or 35.5 or 35.48… or 55 ÷ 93 or 0.6 or 0.59…	1	accept any correct method	
			Their 31 × 100 or 3100 or *their* 33.3... × 93 or *their* 35.5 × 3	1		
			their 3100 ÷ 60 soi by 51.6[6..] or 51.7 or 52 or 51[min] 40[sec] or 55 × 60 soi 3300 or 106[.5] or 106.45…	1		e.g. 106.45 lengths in 55 mins
			106.45 or 106[.5] > 100 or 51.6[6]. or 51.7 or 52 or 51[min] 40[sec] < 55 or 31[00] < 33[00] or So he can swim that distance	1	Conclusion or comparison of correct values required	
	(b)		he swims at the same rate	1	accept any correct statement e.g. he does not slow down, no breaks	See appendices
	(c)		he will get tired/he will slow down/not take breaks	1	accept any correct statement	See appendices
17	(a)		4 points correctly plotted	2	**B1** for 2 or 3 points correctly plotted	tolerance ±1 mm
	(b)		Strong / good	1		
			positive	1		
	(c)		71.[42…] or 71.4[3] nfww	4	**B1** for 21 **B1** for 15 **M1** for (*their* 15)÷21 ×100 oe If **0** scored **SC1** for '*y = x*' drawn or, if points not plotted in (a), **SC1** for $\frac{12}{17}$	21 from 17+4 **FT** their diagram

Question			Answer	Marks	Part marks and guidance	
18			21	4	**B1** for 6 and 9 **M1** for *their* 6 × 5 **M1** for *their* 6 × 5 – *their* 9	Implied by 6:30
19			38.7	6		Allow 39
					B3 for 50 for *DE* or *CF* nfww Or **M1** for $62.5^2 - 37.5^2$ **M1** for $\sqrt{62.5^2 \pm 37.5^2}$ And B3 FT for $\sin^{-1}\frac{their\,50}{80}$ correctly evaluated or **M2 FT for** ft for $\sin^{-1}\frac{their\,50}{80}$ or **M1 FT** for $\sin[x] = \frac{their\,50}{80}$	May be in correct place on diagram 2500 implies **M1**
20	(a)		Accurate perpendicular bisector from at least AB passing within 3cm of C with two pairs of correct arcs	2	**B1** for accurate perpendicular bisector	Tolerance ±2mm
			Arc centre C, at least from BC to CD with radius 3 cm	2	**B1** for any arc centre C	
			Two correct points marked intersecting the line and the arc	1	**Dep** on **B1** (bisector) and **B2** (arc) scored above	

	Question		Answer	Marks	Part marks and guidance	
	(b)		One of the points is not in his garden or only one is in his garden	**1**	accept any correct reason e.g. one point is behind the *CD* fence	
21	**(a)**		[Line] does not go through (0, 0)	**1**		Accept origin, O
	(b)		85	**2**	**M1** for $\dfrac{68}{20}$ soi by 3.4	

APPENDIX

Exemplar responses for Q16(b)

Response	Mark
It took an equal amount of time per length	**1**
He can swim the other lengths at the same speed	**1**
He didn't stop for a break	**1**
He took 31 seconds to swim **each** length	**1 BOD**
Every 3 equals 93sec – **every** 1 equals 31sec	**1 BOD**
He could swim more lengths in under 55 minutes	**0**
He can swim exactly 3 lengths in 93 seconds without losing a couple of seconds	**0**
Needs to swim faster	**0**
He swam 3 lengths in 1min 33sec	**0**
He's a quick swimmer	**0**
That he could/couldn't do it	**0**
That $93 \div 3 = 31$ and $100 \times 31 = 3100$ which is less than 55 min	**0**

Exemplar responses for Q16(c)

Response	Mark
Runs out of breath	**1**
He gets tired/slower	**1**
He may need a break	**1**
He might not be able to swim that far	**1**
He would have to maintain a constant speed	**1 BOD**
He may not keep going at the same speed (doesn't say why)	**1 BOD**
He may take longer to swim 100 lengths	**0**
He's not a good swimmer	**0**
Not enough practice	**0**

Exemplar responses for Q20(b)

Response	Mark
One does not lie inside his garden	**1**
One is outside of the fence	**1**
Only one lies in his garden	**1**