

GCSE

Mathematics

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

General Certificate of Secondary Education

Mark Scheme for November 2018

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of candidates of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, Cambridge Nationals, Cambridge Technicals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

It is also responsible for developing new specifications to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support, which keep pace with the changing needs of today's society.

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.

© OCR 2018

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 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. 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, i.e. incorrect working is seen and 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, e.g. FT $180 \times (\text{their '37' + 16})$, or FT $300 - \sqrt{(\text{their '5}^2 + 7^2)}$. Answers to part questions which are being followed through are indicated by e.g. FT $3 \times \text{their (a)}$.

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 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).
- **nfw** 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)		Correct bar drawn	1		condone freehand
	(b)	(i)	Germany	1		
		(ii)	25	1		
		(iii)	6	1		
2	(a)		Cylinder	1		
	(b)		90° symbol marked at BCD cao	1		Accept 90° <u>with</u> arc
3			364.8[0]	2	M1 for 320×1.14	
4	(a)	(i)	Any even number	1		Accept more than one, if all even
		(ii)	1 or 5 or 25	1		Accept more than one, if all correct Condone 1×25 or 5×5
		(iii)	11 or 13 or 17 or 19	1		Accept more than one, if all correct
		(iv)	Any cube number	1		Accept more than one, if all correct Do not accept e.g. $2 \times 2 \times 2$ or 2^3
	(b)		7	2	M1 for 5, 7 and 7, 13	Could be a correct Venn diagram
5	(a)		1 : 19	1		
	(b)		12	2	M1 for $8 \div 2$ soi by 4 or 8×1.5 oe	
6	(a)		10 final answer	1		
	(b)		4 final answer	1		
7	(a)		81.5 or 8.15×10^1 cao	1		
	(b)		0.005 69 or 5.69×10^{-3} cao	1		
8			$[y =] \frac{x}{3} + 9$ or $[y =] x \div 3 + 9$ final answer	2	M1 for $[y =] \frac{x}{3} + k$ or $[y =] jx + 9$	$j \neq 0$

Question			Answer	Marks	Part marks and guidance	
9			15 with correct supporting working	5	M1 for $140 \div 7$ soi by 20 M1 for $4 \times their\ 20$ and $3 \times their\ 20$ soi by 80 and 60 M1 for $their\ 80 \div 5$ or their $60 \div 4$ A1 for 16 and 15 or M1 for $140 \div 9$ soi by 15.5 M1 for 15×5 and 15×4 soi by 75 and 60 M1 for $140 \div 7$ soi by 20 M1 for $4 \times their\ 20$ and $3 \times their\ 20$ soi by 80 and 60 SC1 for 15 without working	Accept correct alternative methods their 20 must come from a division of 140
10			Vertices at (4, 8) (8, 2) (4, 2)	3	B2 for 2 vertices correct M1 correct enlargement incorrect position	15 from incorrect working scores 0 Condone freehand if vertices $\pm 2mm$ by eye
11	(a)		(2, 4)	1		
	(b)		Q plotted at (-1, 2)	1		
12			23	2	M1 for $8 + 3 \times 5$ or better	
13			31.4[2] or 31.41...	2	M1 for $\pi \times 10$ oe	Method can be spoiled
14	(a)	(i)	7 cao	1		Do not allow a^7 or a^{17}
		(ii)	12 cao	1		Do not allow b^{12} or b^{12}
	(b)		$9x(2x + 1)$ final answer	2	B1 for $9(2x^2 + x)$ or $x(18x + 9)$ or $3x(6x+3)$ or $3(6x^2+3x)$	condone final bracket missing

Question			Answer	Marks	Part marks and guidance	
15	(a)		Medium with correct comparisons and valid reason	4	M3 fully correct method and values to compare all 3 packs Or M2 fully correct method to compare all 3 packs Or M1 for fully correct method to compare any 2 packs After M0 or M1 SC2 for 3 correct comparable values	Condone 150 or [£]3.55 for medium Accept fully correct alternative methods Accept consistent working in pence or pounds SC2 replaces M1
	(b)		Correct statement	1		Do not accept contradictory statements See exemplars
16			$7x + 2$ final answer	4	B2 for $28x + 8$ or B1 for $28x + k$ or $jx + 8$ or M1 for $5x + 3 + 7x + 4 + 9x - 10 + 5x + 8 + 2x + 3$ AND M1 for <i>their</i> $(28x + 8) \div 4$ so	$j \neq 0$ B1 not from only one side e.g. $5x + 8$ must be an algebraic expression in the form $ax + b$

Question			Answer	Marks	Part marks and guidance	
17			246	6	B1 for $6\frac{1}{2}$, 6.5 or 6 h 30 m AND M2 for <i>their</i> $6\frac{1}{2} \times 2 \times 12$ soi by 156 or M1 for <i>their</i> $6\frac{1}{2} \times 12$ soi by 78 or <i>their</i> $6\frac{1}{2} \times 2$ AND M2 for $12 \times 1\frac{1}{2} \times 5$ soi by 90 or M1 for $12 \times 1\frac{1}{2}$ soi by 18 or $1\frac{1}{2} \times 5$ soi by $7\frac{1}{2}$ or 12×5 soi by 60	13, 78 or 156 imply B1

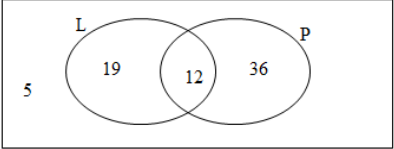
Question			Answer	Marks	Part marks and guidance	
18			10:50 [am]	4	SC3 for 10:50 pm OR B2 for LCM as 140 or 2 hours 20 [min] and M1 for [0] 8:30 plus <i>their</i> LCM OR M1 for $20 = 2 \times 2 \times 5$ and $35 = 5 \times 7$ and M1 for [0]8:30 plus <i>their</i> LCM OR B1 for listing [0]8:50, [0]9:10, [0]9:30 and B1 for listing [0]9:05, [0]9:40, 10:15	<i>Their</i> LCM must be correctly converted to hours and minutes No incorrect times in between [0]8:30 and [0]9:30 or [0]8:30 and 10:15

Question			Answer	Marks	Part marks and guidance	
19			Arc centre D radius 6 cm meeting AD and DC or DC and bisector of ABC	2	B1 for any arc centre D	Accept dashed or dotted for all marks Arc must be complete within ABCD not freehand Allow beyond AD and DC for 1 or 2 marks Tolerance 5.8 to 6.2 cm
			Ruled bisector of angle ABC to reach DC with construction arcs or Bisector with construction arcs from ABC to <i>their</i> arc centre D	2	B1 for correct ruled bisector at least 2cm long by eye with no construction arcs	Tolerance $\pm 2^\circ$
			Correct region shaded	1	Dep on B2 and at least B1	
20			28.8	3	M2 for $\sqrt{30^2 - 8.4^2}$ or M1 for $x^2 + 8.4^2 = 30^2$ oe	Allow answer of 29 after M2 scored

Question			Answer	Marks	Part marks and guidance	
21			8 cao	4	M3 for $\frac{\text{their } 60 \times 2.25 - 125}{125}$ soi [0].08 or M2 for <i>their</i> $60 \times 2.25 - 125$ soi 10 or M1 for 60×2.25 soi 135	allow work in £ or p, alt method : M3 for $\frac{\text{their } 60 \times 2.25}{125} - 1$ soi [0].08 or M2 for <i>their</i> $135 \div 125$ soi by 1.08 or 108% or M1 for 60×2.25 soi 135 OR M3 for $\frac{2.25 - \text{their } 125 \div 60}{\text{their } 125 \div 60}$ soi [0].08 or M2 for $2.25 - \text{their } 125 \div 60$ soi 0.16[6...] or 0.17 or M1 for $125 \div 60$ soi 2.08[3...]

Question			Answer	Marks	Part marks and guidance	
22	(a)		a correct distance conversion e.g. $400 \div 1000$ or $[0].4$ or 5×1000 or 5000 a scale factor e.g. $5[000] \div 400$ soi by figs 125 or $840 \div 66$ soi by 12.727...or 12.73 or figs 127 correct time conversion e.g. 14×60 or 840 or $66 \div 60$ or 1[m] 6[s] or 1.1 or $825 \div 60$ correct figures e.g. 13.75 or 13.7 or 13.8 [14] 5.09... or 5.1 [5] 5090[. ...] or 5100 5000 825 840 12.5 12.7... 5.95 or 5.9 or 6 6.06... or 6.1	M1 M1 M1 A1	accept any correct method Dep on M3	
	(b)		an acceptable response e.g. [he will not maintain this rate because] he will get tired	1		Accept any correct reason must not be contradicted.

Question			Answer	Marks	Part marks and guidance	
23			15.38 cao	6	M2 for 6400×1.025^8 oe soi by 7797.78 or M1 for 1.025^k ($k > 1$) soi 6724 AND M2 for $6400 + 6400 \times [0].027 \times 8$ oe soi 7782.4 or M1 for $6400 \times [0].027$ oe soi 172.8 or 1382.4 AND M1 for subtracting <i>their</i> two totals or <i>their</i> two interests e.g. <i>their</i> 7797.7785... – <i>their</i> 7782.4 or <i>their</i> 1397.78 – <i>their</i> 1382.4	
24	(a)		0.6 0.7, 0.3, 0.7, 0.3 (White), not white, white, not white	1 1 1		Alternative answer 0.7, 0.3, 0.3, 0.7 (White), not white, not white, white
	(b)		[0].12	2	Correct or ft <i>their</i> 0.3 M1 for 0.4×0.3 ft <i>their</i> 0.3	isw incorrect conversions after 0.12
25			28 or [£][0] .28	5	B1 for $7r + 15c = 7[00]$ or $[r =] c + [0.]12$ M1 for $7(c + [0.]12) + 15c = 7[00]$ or better oe or $r - c = [0.]12$ M1 for $7c + 84 + 15c = 7[00]$ or better oe or $7r - 7c = [0.]84$ M1 for $15c + 7c = 7[00] - [0.]84$ or better	Allow any pair of letters, Trial-and-improvement will score 0 or 5 only allow work in pence or pounds i.e. removing brackets i.e. rearranging their equation
26			$33 - 5n$ oe	2	M1 for $-5n + k$ oe or for $mn + 33$ oe ($m \neq 0$)	condone use of other variable condone $n = 33 - 5n$ for 1 mark

Question			Answer	Marks	Part marks and guidance	
27	(a)			3	B2 for three correct entries ignore labels or B1 for one element in the correct place	
	(b)		$\frac{36}{72}$ oe	2	FT <i>their</i> labelled Venn diagram (2 sets) for 2 marks e.g. $\frac{\text{their } 36}{72}$ B1 for $\frac{k}{72}$ where $k < 72$	isw cancelling and conversion, accept 50% for 2 marks

APPENDIX

Exemplar responses for Q15b

Response	Mark
May be a person who lives alone and only wants a small pack	1
May be having a party so want a lot	1
They don't have enough money	1
They may not have done the calculation [correctly]	1

OCR (Oxford Cambridge and RSA Examinations)
The Triangle Building
Shaftesbury Road
Cambridge
CB2 8EA

OCR Customer Contact Centre

Education and Learning

Telephone: 01223 553998

Facsimile: 01223 552627

Email: general.qualifications@ocr.org.uk

www.ocr.org.uk

For staff training purposes and as part of our quality assurance programme your call may be recorded or monitored

Oxford Cambridge and RSA Examinations
is a Company Limited by Guarantee
Registered in England
Registered Office; The Triangle Building, Shaftesbury Road, Cambridge, CB2 8EA
Registered Company Number: 3484466
OCR is an exempt Charity

OCR (Oxford Cambridge and RSA Examinations)

Head office

Telephone: 01223 552552

Facsimile: 01223 552553

© OCR 2018

Find Personal Tutor from www.wisesprout.co.uk

找名校导师，用小草线上辅导（微信小程序同名）

