



Mark Scheme (Results)

January 2016

Pearson Edexcel International GCSE
Mathematics A (4MA0)
Paper 1F

Pearson Edexcel Certificate
Mathematics A (KMA0)
Paper 1F

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications are awarded by Pearson, the UK's largest awarding body. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk. Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

Pearson: helping people progress, everywhere

Pearson aspires to be the world's leading learning company. Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

January 2016

Publications Code UG043247

All the material in this publication is copyright

© Pearson Education Ltd 2016

General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.
- **Types of mark**
 - M marks: method marks
 - A marks: accuracy marks
 - B marks: unconditional accuracy marks (independent of M marks)
- **Abbreviations**
 - cao – correct answer only
 - ft – follow through
 - isw – ignore subsequent working
 - SC - special case
 - oe – or equivalent (and appropriate)
 - dep – dependent
 - indep – independent
 - eoo – each error or omission
 - awrt – answer which rounds to

- **No working**

If no working is shown then correct answers normally score full marks

If no working is shown then incorrect (even though nearly correct) answers score no marks.
- **With working**

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

If it is clear from the working that the “correct” answer has been obtained from incorrect working, award 0 marks.

Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks.

If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.

If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

If there is no answer on the answer line then check the working for an obvious answer.
- **Ignoring subsequent work**

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: eg. Incorrect cancelling of a fraction that would otherwise be correct.

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect eg algebra.

Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.
- **Parts of questions**

Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

Apart from Questions 16 and 18 (where the mark scheme states otherwise), the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method.

Question	Working	Answer	Mark	Notes
1 (a)		Jakarta	1	B1 accept 8943
(b)		eight thousand one hundred and three	1	B1
(c)		8220	1	B1 cao
(d)		3520	1	B1 cao
(e)	3493 + 8220			M1
		11 713	2	A1
				Total 6 marks

Question	Working	Answer	Mark	Notes
2 (a)(i)		$\frac{7}{10}$		B1
(a)(ii)		0.7	2	B1 ft from (a)(i) at least 3 sig figs truncated or rounded for recurring decimals OR correct answer
(b)(i)		2 triangles shaded		B1
(b)(ii)		$\frac{25}{100}$	2	B1 accept any fraction equivalent to $\frac{25}{100}$ eg. $\frac{1}{4}$, $\frac{5}{20}$
(c)		57	1	B1
				Total 5 marks

3	a		Tpad	1	B1
	b		315	1	B1
	c		13.7	1	B1
	d	165 × 6 (=990)oe or subtraction of at least 165 from 1000			M1
	1000 – "990"			M1 dep	for a complete method
			10	3	A1
Total 6 marks					

4	a		4, 5, 4, 7	2	B2	for correct frequencies B1 for at least 2 correct frequencies or tallies	
	b		9	1	B1	ft from (a) or 9	
	c		6	1	B1		
	d		eg. 3 is a factor of 9	1	B1	for identifying 9 with a correct reason	
	e	4MA0 2016 January Paper 1F GradeMax		(6), 8, (10), 12 8,(10),(12),14 (10),12,14,16 12,14,16,18	2	B2	B1 for at least 4 correct entries
	fi			$\frac{3}{16}$ oe	2	B2	B1 for $\frac{a}{16}$ with $a < 16$ or $\frac{3}{b}$ with $b > 3$ or 3 and 16 used with incorrect notation (eg. 3 : 16) ft from complete table for numerator only
	fii			$\frac{6}{16}$ oe	1	B1	ft from complete table for numerator only
Total 10 marks							

5	a		32	1	B1
	b		reason	1	B1 eg. doubled 16, 2^{n-1}
	c		512	1	B1 accept 2^9
					Total 3 marks

6	a		octagon	1	B1 condone incorrect spelling
	b		reason	1	B1 eg. sides are not all the same length or only 2 lines of symmetry
	c		parallel lines marked	1	B1
					Total 3 marks

7	a		$(-3, 1)$	1	B1 cao
	b		Shape drawn with vertices $(-3, -1)$ $(-1, -1)$ $(-1, -4)$	1	B1 cao
	c		3 cm^2	2	B2 for 3 cm^2 B1 for 3 ; B1 for cm^2 If lengths seen in mm, allow B1 for 300; B1 for mm^2
					Total 4 marks

8	a		$10k$	1	B1
	b		$4eg$	1	B1
c		$6m = 17 - 5$			M1 $6m = 12$
			2	2	A1
d		$5(3r + 2)$		1	B1
e		y^9		1	B1
f		$x^2 + 5x - x - 5$			M1 for 3 correct terms out of a maximum of 4 terms or for 4 correct terms ignoring signs or for $x^2 + 4x + k$ for any non-zero value of k or for $\dots + 4x - 5$
			$x^2 + 4x - 5$	2	A1
					Total 8 marks

9	ai	$360 - 53 - 110 - 90$			M1	
				107	2	A1
	aii		<u>Angles at a point</u> add up to <u>360°</u>		1	B1
b		$(180 - 1) \div 2 (=31)$			M1 may be seen on diagram	
		$180 - '3'$			M1 dep or 118 + '31'	
				149	3	A1
					Total 6 marks	

10	ai		10:15 am	1	B1
	aii		15:50	1	B1
	b	1.75 or $1\frac{3}{4}$ or 105			M1 for correctly converting "1hr 45 mins" into a decimal or fraction or minutes (eg. 1.75h or 105 min)
		$140 \div$ "1.75" or $\frac{140}{\text{"105"}} \times 60$			M1 independent but "1.75" or "105" must be correct for their duration accept $140 \div 1.45$
			80	3	A1
					Total 5 marks

11	a	$1200 \times 0.7 (=840)$ or $1200 \div 6 (=200)$ oe or $0.166... \times 1200 (=200)$			M1	M1 for $\frac{(70+16.6...)}{100} \times 1200 (=1040)$ or $0.866... \times 1200 (=1040)$ oe	M2 for $\frac{100 - (70+16.6...)}{100} \times 1200$ or $0.133... \times 1200$
		$1200 - 1200 \times 0.7 - 1200 \div 6$			M1 dep	M1 (dep) for $1200 - "1040"$	
NB: Accept 2 or more sig figs truncated or rounded for 16.6..., 13.3..., 0.166..., 0.133... in working							
			160	3	A1		
	b	1200 : 900			M1	for any ratio equivalent to 1200 : 900 or 3 : 4	
			4 : 3		2	A1	
							Total 5 marks

AMA0 | 2016 | January | Paper 1F | GradeMax

12	a	$(17 + 7) \div 4$ or $24 \div 4$			M1 accept $17 + 7 \div 4$
			6	2	A1
	b		$4x - 7$	2	B2 B1 for $4x$ or $4 \times x$ NB: $x = 4x - 7$ scores B1 only
					Total 4 marks

13		$\frac{3}{8} \times \frac{12}{7}$			M1
			$\frac{36}{56}$ oe	2	A1 dep on M1 Accept $\frac{9}{14}$ if clear cancelling seen NB: Use of decimals gains M0 A0
		Alternative: $\frac{9n}{24n} \div \frac{1}{2}$ for any integer n			M1 Must see an intention to divide
			$\frac{9}{14}$ oe	2	A1 dep on M1 Answer must come directly from their method eg. $\frac{36}{96} \div \frac{56}{96}$ must be followed by $\frac{36}{56}$
					Total 2 marks

14	a	eg. $24 \div 6 \times 800$			M1 for a complete method
			3200	2	A1 accept 3.2 litres
	b	eg. $450 \div 300 \times 6$			M1 for a complete method
			9	2	A1
					Total 4 marks

15	a	$6 \div 40 \times 360$ oe			M1
			54	2	A1
	b		20 to 24 oe	1	B1
	c	$2 \times 6 + 7 \times 3 + 12 \times 5 + 17 \times 12 + 22 \times 14$ or $12 + 21 + 60 + 204 + 308$ or 605			M2 freq \times all correct midpoint values stated (or evaluated) with intention to add (condone any two errors in midpoints or frequencies) If not M2 then award M1 for all products $t \times f$ (and t is consistently within the interval, including end values) and intention to add (condone any two errors in their midpoints or frequencies)
"605" \div 40 or $\frac{2 \times 6 + 7 \times 3 + 12 \times 5 + 17 \times 12 + 22 \times 14}{6 + 3 + 5 + 12 + 14}$				M1 dep on at least M1	
		15.125	4	A1 accept 15 or 15.1 or 15.13 from correct working with no errors (15 without working gains M0 A0) NB. Accept 15.1625 (using 2.25 as mi-interval in first class)	
	d	$14 \div 40 \times 100$ oe			M1 award M1 for $26 \div 40 \times 100$ or 65%
			35	2	A1
					Total 9 marks

4MA0 | 2016 | January | Paper 1F | GradeMax

16		bisector with construction arcs	2	B2 for bisector within guidelines with two pairs of relevant construction arcs seen If not B2 then B1 for a bisector within guidelines with no arcs present or relevant arcs present with no bisector
				Total 2 marks

17	a		1,2,3,4,5,6,7,9	1	B1 no repeats
	b		eg. 4, 5, 7, 8	2	B2 for 4, 5, and any two of 7, 8, 9, 10 If not B2 then B1 for 4,5 or 4,5 and any one or two other numbers from the universal set or 4, 5, 7, 8, 9, 10 or 7, 8, 9, 10 or Venn diagram with 4,5 in intersection and any two correct numbers (eg. 8,10) in C
					Total 3 marks

18	$6x + 15$			M1	for correct expansion of bracket OR division of all terms in a correct equation by 3
	$6x + x = 4 - 15$			M1	for correct rearrangement within a correct equation with x terms on one side and numbers on the other
		$-1\frac{4}{7}$ oe	3	A1	Award full marks for a correct answer if at least 1 method mark awarded (allow $-\frac{11}{7}$ as final answer) accept $-1.57(1428\dots)$
				Total 3 marks	

19	a	$\pi \times 5.4^2 \times 6$			M1
			1466	2	A1 answer in range 1464.9 - 1466
	bi		5.45	1	B1 accept 5.449
	bii		5.35	1	B1
					Total 4 marks

20	a	(-2, -1) (-1, 1) (0, 3) (1, 5) (2, 7) (3, 9) (4, 11)	correct line	3	<p>B3 for $y = 2x + 3$ drawn from $x = -2$ to 4</p> <p>if not B3 then B2 for a correct straight line segment through at least 3 of $(-2, -1)$ $(-1, 1)$ $(0, 3)$ $(1, 5)$ $(2, 7)$ $(3, 9)$ $(4, 11)$ OR</p> <p>for all of $(-2, -1)$ $(-1, 1)$ $(0, 3)$ $(1, 5)$ $(2, 7)$ $(3, 9)$ $(4, 11)$ plotted but not joined</p> <p>if not B2 then B1 for any 2 correct points stated (could be in a table) or plotted OR a line with a positive gradient through $(0, 3)$ OR a line with gradient 2</p>
	b				M1 for $x = 3$ and $y = 2$ drawn
		4MAA0 2016 January Paper 1F GradedMax	correct region	2	A1 for correct region identified (R need not be labelled) Accept shaded or unshaded
					Total 5 marks

21	$\tan ACB = \frac{4.5}{9.6}$			M1 for correct trig statement eg. $\sin ACB = \frac{4.5}{\sqrt{112.41}}$ or $\cos ACB = \frac{9.6}{\sqrt{112.41}}$
	$\tan^{-1} \left(\frac{4.5}{9.6} \right)$			M1 dep
		25.1	3	A1 awrt 25.1
				Total 3 marks

