Mark Scheme (Results)

Summer 2015

Pearson Edexcel International GCSE
Mathematics A (4MA0)
Paper 2F

Pearson Edexcel Level1/Level 2 Certificate
Mathematics A (KMA0)
Paper 2F

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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
    - eeoo – 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.

Question		Working	Answer	Mark	Notes	
1	(a)(i)		1000		B1	
	(a)(ii)		100	2	B1	
	(b)		−7	1	B1	
	(c)		1,2,4,7,14,28	2	B2	B1 for at least 3 correct factors and none incorrect, may be seen as product pairs; ignore repeats; ignore negatives. Allow 1 mark if all correct and at most 1 incorrect.
	(d)		2, 23	2	B2	B1 for 2 or 23; if more than 2 given, -1 for each incorrect value
					Total 7 marks	

2	(a)		five thousand, four hundred and sixty seven	1	B1	
	(b)	5467 + 3543 − 6799 oe			M1	
			2211	2	A1	
					Total 3 marks	

3	(i)		metres	1	B1	accept m
	(ii)		litres	1	B1	accept l
	(iii)		grams	1	B1	accept g, grammes
					Total 3 marks	

4	(a)(i)		pyramid	1	B1	accept square-based pyramid or rectangular-based pyramid
	(a)(ii)		cuboid	1	B1	accept square prism or rectangular prism
	(b)		8	1	B1	cao
	(c)		6	1	B1	cao
						Total 4 marks

5	(a)		17, 14	2	B2	B1 for 17 ; B1 for 14
	(b)		subtract 3; −3	1	B1	oe
	(c)		−7	1	B1	cao
						Total 4 marks

6	(a)		Saturday	1	B1	accept Sat
	(b)		40	1	B1	
	(c)		76	1	B1	
	(d)		Monday	1	B1	accept Mon
	(e)	90 : 60 or 9 : 6		2	M1	or any ratio equivalent to 3 : 2 or a final answer of 2 : 3
			3 : 2		A1	Allow 1.5 : 1 or 1 : $\frac{2}{3}$
						Total 6 marks

7	(a)		80	1	B1	
	(b)		$\dfrac{23}{1000}$	1	B1	
	(c)		5.64	1	B1	
	(d)	$6.5 + 1.69$		2	M1	for 6.5 or 1.69 or $\dfrac{819}{100}$ or 8.2
			8.19		A1	
	(e)	$\dfrac{3}{8} \times 56.8$ or $56.8 \div 8 \times 3$ oe		2	M1	or $\dfrac{213}{10}$
			21.3		A1	
						Total 7 marks

8		$8.3 \times 2 + 4.5 \times 2$ oe $(=25.6)$		3	M1	
		$"25.6" - 10.6$			M1	dep
			15		A1	
						Total 3 marks

9	(a)		$4e$	1	B1	Allow e4
	(b)		$7cd$	1	B1	$7dc$, $d7c$, $dc7$ etc but award no mark if multiplication signs are present
	(c)		$11m + 3k$	2	B2	for $11m + 3k$ B1 for $11m$; B1 for $3k$
						Total 4 marks

10	(a)		10	1	B1	Accept −10 or ±10
	(b)	1, 4, 9, 16... 1, 8, 27...	25 and 64 **or** 64 and 27 **or** 81 and 1 **or** 81 and 8	3	M1 M1 A1	or any square number identified or any cube number identified allow 5^2, 4^3 or 8^2, 3^3 or $9^2,1^{(3)}$ or 9^2, 2^3 but not 5,4 etc
						Total 4 marks

11	(a)	$\frac{5}{8} = 0.625$ $\frac{3}{4} = 0.75$ $\frac{7}{16} = 0.4375$ $\frac{2}{3} = 0.666..$	$\frac{7}{16}$ $\frac{5}{8}$ $\frac{2}{3}$ $\frac{3}{4}$	2	B2	for $\frac{7}{16}$ $\frac{5}{8}$ $\frac{2}{3}$ $\frac{3}{4}$ **or** for correct decimal equivalents in correct order **or** for correct fraction equivalents in correct order If not B2, then B1 for: • 3 fractions in correct order **or** • 2 fractions correctly converted to decimals or percentages (at least 2 sf rounded or truncated) **or** • 2 fractions expressed as equivalent fractions with a denominator of 48 (or a multiple of 48) SC: B1 for $\frac{3}{4}$ $\frac{2}{3}$ $\frac{5}{8}$ $\frac{7}{16}$ (reverse order)
	(b)			2	M1	for $\frac{x}{120}$ with $x < 120$ or B1 for $\frac{113}{y}$ with $y > 113$
			$\frac{113}{120}$		A1	
						Total 4 marks

12	$10 - 2.50 - 1.25 - 1.30$ oe (=4.95)				M1	Subtracting at least 2 of 2.50, 1.25, 1.30 from 10
	'4.95' ÷ 3				M1	dep
			1.65	3	A1	
						Total 3 marks

13	(a)			4	1	B1	accept ×4
	(b)	$y = -x$ drawn			2	M1	$y = -x$ drawn or a congruent shape with the correct orientation in the 1st quadrant or a correct reflection in $y=x$
			(2,2) (2,5) (4,5) (4,3)			A1	
	(c)		Rotation about (0, −1) 90° clockwise		3	B1	Rotation (not turn)
						B1	(centre) (0, −1)
						B1	90° clockwise or −90° or 270° anti-clockwise or +270°
							NB. If more than one transformation given then no marks should be awarded
							Total 6 marks

14	(a)		0	1	B1	0%
	(b)		0.8 oe	1	B1	
	(c)	$1 - \dfrac{2}{5}$ or $\dfrac{3}{5}$ oe			M1	or for $\dfrac{2}{5} \times 20$ oe or 8 or $\dfrac{8}{20}$
		$\dfrac{3}{5} \times 20$ oe		3	M1	(dep) for 20 − '8'
			12		A1	(NB: $\dfrac{12}{20}$ gains M2, A0)
						Total 5 marks

15	(a)		1	1	B1	
	(b)	$6 - 1$		2	M1	For 6 and 1 identified
			5		A1	
	(c)	$(25 + 1) \div 2$ or 13 or 12.5			M1	or listing scores and clear attempt to find middle value
			2	2	A1	
	(d)	$1{\times}9 + 2{\times}6 + 3{\times}3 + 5{\times}1 + 4{\times}6$ oe(=67)		3	M1	sight of at least 4 products and intention to add (can be their 25 if evidence of adding frequencies)
		"67"÷25 or $\dfrac{9+12+9+8+5+24}{25}$ oe (allow one error in a product)			M1	dep for division of sum of products by 25 (can be their 25 if evidence of adding frequencies)
			2.68 or $2\dfrac{17}{25}$		A1	accept 2.7 or 3 if preceded by $\frac{67}{25}$
	(e)			2	M1	$\dfrac{x}{25}$; $x < 25$ **or** $\dfrac{2}{y}$; $y > 2$
			$\dfrac{2}{25}$ oe		A1	accept 0.08, 8%
						Total 10 marks

16	(a)(i)		90	1	B1	
	(a)(ii)		25	1	B1	
	(b)		line from (13 45, 45) to (15 15, 45) and line from (15 15, 45) to (16 30, 0)	2	B2	B1 for line from ((13 45, 45) to (15 15, 45) **or** for a line from (x, 45) to (16 30, 0) where x is a time before 1630
						Total 4 marks

17	(a)	angle MRQ (or RMQ) $= x$ or $\dfrac{180-y}{2}$		2	M1	could be marked on diagram **or** for a correct equation in x and y
			$180 - 2x$		A1	oe eg $2(90 - x)$, $2(180 - x) - 180$ etc
	(b)	$(6 - 2) \times 180$ oe $(=720)$		4	M1	or $(180 - 360 \div 6) \times 6$
		"720" $- (90 + 115 + 144 + 87)$ [720 − 436] **or** 284			M1	dep
		"284" $\div 2$			M1	dep
			142		A1	
		alternative			M1	A correct method to find each of the exterior angles at A,C,D & E – angles could be seen on diagram.
		$180 - 90(=90)$, $180 - 115(=65)$, $180 - 144(=36)$, $180 - 87(=93)$		4	M1dep	
		$360 - ("90"+"65"+"36"+"93")$ $(= 76)$			M1dep	A correct method to find the total of the remaining exterior angles
		$180 - ("76" \div 2)$	142		A1	A correct method to find k
						Total 6 marks

18	(a)		$24 - 18y$	1	B1	
	(b)		$e(e + 4)$	1	B1	Allow $e(4 + e)$ and $(e + 0)(e + 4)$
	(c)	Eg. $7x - 2x = -3 - 8$		3	M1	for correct rearrangement with x terms on one side and numbers on the other **or** the correct simplification of either x terms or numbers on one side in a correct equation eg. $5x + 8 = -3$; $7x = 2x - 11$
		$5x = -11$			M1	Award also for $-5x = 11$
			-2.2 oe		A1	-2.2 oe dependent on at least M1 awarded; **If no correct algebraic working then award no marks**
	(d)	$y^2 + 10y - 2y - 20$			M1	for 3 correct terms out of 4 or for 4 correct terms ignoring signs or for $y^2 + 8y + c$ for any non-zero value of c or for ... $+ 8y - 20$
			$y^2 + 8y - 20$	2	A1	cao
						Total 7 marks

19	$15 \div (6 - 4) \ (=7.5)$			M1	or use of cancelled ratios (eg 3:6:4 = 0.75:1.5:1, 15÷0.5(=30))
	"7.5" × 3 (=22.5)		3	M1	dep ; or cancelled ratios, (eg 30×0.75) or M2 for $15 \div \dfrac{2}{3}$ oe
		22.5(0)		A1	
	Alternative				
	$\dfrac{6n}{13} - \dfrac{4n}{13} = 15$ **or** $\dfrac{2n}{13} = 15$ oe **or** $15 \times \dfrac{13}{2}$ oe **or** n = 97.5		3	M1	
	$\dfrac{3}{3+6+4}$ × 97.5 oe			M1	dep
		22.5(0)		A1	
	Alternative				
	(3 : 6 : 4)…..21 : 42 : 28 and 24 : 48 : 32		3	M1	For using ratios and seeing 21 : 42 : 28 and 24 : 48 : 32
	22.5 : 45 : 30			M1	Correct line **or** (21+24)÷2
		22.5(0)		A1	
					Total 3 marks

20	(a)	$-5-4 < x \le 3-4$		2	M1	subtraction of 4 from either side in an inequality **or** one side of inequality correct (eg $x \le -1$) or for $-5-4(=-9)$ and $3-4(=-1)$
			$-9 < x \le -1$		A1	Accept x > -9 (and) x ≤ -1
	(b)		$-3, -2, -1, 0, 1$	2	B2	B1 for one omission or addition
						Total 4 marks

21		$\cos 39 = \dfrac{11.3}{x}$ oe		3	M1	or $\dfrac{x}{\sin 90} = \dfrac{11.3}{\sin(180-90-39)}$
		$(x =) \dfrac{11.3}{\cos 39}$			M1	or $x = \dfrac{11.3}{\sin(180-90-39)} \times (\sin 90)$
			14.54		A1	awrt 14.54
		Alternative				
		$\tan 39 = \dfrac{y}{11.3}$; $y = 9.15...$ "9.15"$^2 + 11.3^2 = x^2$			M1	Must get to correct Pythagoras statement
		$(x =) \sqrt{"9.15"^2 + 11.3^2}$ oe			M1	
			14.54		A1	awrt 14.54 (NB: 14.5 with no working gains M0A0)
						Total 3 marks

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