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Mark Scheme (Results)

January 2015

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

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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

- **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: e.g. 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.

IGCSE Maths Jan 2015 - Paper 2FR Mark scheme

Apart from Questions 20 and 25a where the mark scheme states otherwise, the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method.

Ques	Working	Answer	Mark	Notes
1a		16	1	B1
b		20	1	B1
	20 + 10 = 30	3 full eggs and three quarters	2	M1 '20' + 10 or 1.5 full eggs drawn
c				A1 ft
				Total 4 marks

Ques	Working	Answer	Mark	Notes
2a		$\frac{3}{8}$	1	B1
b		$\frac{3}{5}$	1	B1 oe
c		0.4	1	B 1
				Total 3 marks

Ques	Working	Answer	Mark	Notes
3ai		acute	2	B1
aii		60		B1 58 - 62
b		R placed correctly	1	B1
				Total 3 marks

Ques	Working	Answer	Mark	Notes
4		Correct circle	2	B2 correct circle (B1 circle with radius 6 cm or for circle partially within guidelines or radius 3 cm centre P or centre Q)
				Total 2 marks

Ques	Working	Answer	Mark	Notes
5	3 × 1000 or 340 ÷ 1000		3	M1
	3000 ÷ 340 or 3 ÷ 340 =8.82...			M1 allow “3000” ÷ 340
		8		A1
				Total 3 marks

Ques	Working	Answer	Mark	Notes
6a		19 00	1	B1 19 00
b	8:40 to 9:40 to 10:00 +(45 - 20) 8:40 + 1:45= 9:85		2	M1 for a correct approach by addition eg 8:40 to 9:40 to 10:00 + (45 - 20) or 8:40 + 1:45= 9:85
		10:25		A1 10:25
c	$\frac{40}{60}$	$\frac{2}{3}$	2	B2 for $\frac{2}{3}$ (B1 any other equivalent fraction)
				Total 5 marks

Ques	Working	Answer	Mark	Notes
7ai		Marked at 0.5	1	B1 professional judgement
aii		Marked at 0	1	B1 professional judgement
b		Likely	1	B1
				Total 3 marks

Ques	Working	Answer	Mark	Notes
8	84 ÷ 3 = 28		3	M1
	84 - 28 or 2 × 28			M1 dep
		56		A1
				Total 3 marks

Ques	Working	Answer	Mark	Notes
9a	6 × 40 = 240 240 + 50		2	M1
		290		A1
b	410 - 50 = 360		2	M1 or 6 + (410 - '290') ÷ 40
	360 ÷ 40	9		A1
				Total 4 marks

Ques	Working	Answer	Mark	Notes
10a		$7m$	1	B1
b		$5x$	1	B1
c		$12y$	1	B1
d	4 × 2 + 9	17	1	B1
e	2×3^2	18	1	B1
				Total 5 marks

Ques	Working	Answer	Mark	Notes
11a	<table><tr><td>B / A</td><td>**1**</td><td>**2**</td><td>**3**</td><td>**4**</td></tr><tr><td>**1**</td><td>**2**</td><td>**3**</td><td>**4**</td><td>**5**</td></tr><tr><td>**2**</td><td>**3**</td><td>**4**</td><td>**5**</td><td>6</td></tr><tr><td>**3**</td><td>**4**</td><td>5</td><td>**6**</td><td>**7**</td></tr><tr><td>**4**</td><td>**5**</td><td>**6**</td><td>7</td><td>**8**</td></tr></table>	Correct table	2	B2 fully correct table (B1 6 or more correct entries)
b			2	M1 for $\frac{n}{16}$ with $0 < n < 16$ or for $\frac{3}{m}$ with $m > 3$
		$\frac{3}{16}$ oe		A1
c			2	M1 all 6 cases identified (condone 1 error)
		$\frac{6}{16}$ oe		A1
				Total 6 marks

Ques	Working	Answer	Mark	Notes
12a		Rectangle with 8 squares	1	B1
b		Isosceles triangle with 8 cm^2	2	B2 (B1 for isosceles triangle with area not 8 cm^2 or for non-isosceles triangle with area of 8 cm^2)
				Total 3 marks

Ques	Working	Answer	Mark	Notes
13a		3	1	B1 2.8 - 3.2
b		−14	1	B1 ft
c	20 + '14'	34	1	B1 ft Accept -34
				Total 3 marks

Ques	Working	Answer	Mark	Notes
14a	8 × 5 × 50		2	M1
		2000		A1
b	12.5 × 25 = 312.5		3	M1 for 12.5 × 25 (= 312.5)
	2000 ÷ 312.5			M1 "2000" ÷ 312.5
		6.4		A1 ft
				Total 5 marks

Ques	Working	Answer	Mark	Notes
15a		23	1	B1
b	1200 ÷ 8 × 12		2	M1 1200 ÷8 × 12 oe
		1800		A1
				Total 3 marks

Ques	Working	Answer	Mark	Notes
16		A $x = 3$ B $y = -2$ C $y = -x$	3	B1 B1 B1
				Total 3 marks

Ques	Working	Answer	Mark	Notes
17	600 × 67.1 (= 40260) **or** 67.1 ÷ 82.5 (=0.813…)		3	M1
	"40260" ÷ 82.5 **or** "0.813.." × 600			M1 dep
		488		A1 SC: B2 for 712
				Total 3 marks

Ques	Working	Answer	Mark	Notes
18a	$\pi \times 150$ oe		2	M1
		471		A1 awrt 471
b	30 × 60 (=1800) **or** "471" ÷ 30 (=15.7)		3	M1
	"471" ÷ "1800" **or** "15.7" ÷ 60			M1 dep
		0.262		A1 for 0.26 – 0.262 or ft from (a)
c	Radius = $x - h$ **or** $\frac{D}{2} = x - h$ oe		2	M1
		$h = x - \frac{D}{2}$ oe		A1 or $h = \frac{2x - D}{2}$
				Total 7 marks

Ques	Working	Answer	Mark	Notes
19	Angle *DAB* = 110		4	B1 can be implied by angle *DAX* = angle *BAX* = 55^{o}
	Angle *BAX* =110 ÷ 2 (= 55) **or** Angle *DAX* =110 ÷ 2 (= 55) **or** Angle *AXD* = 55			M1
	Angle *AXD* = 55 **or** Angle *CBA* = 180 – 110 (=70) **or** Angle *ADC* = 180 – 110 (=70)			M1
		125		A1
				Total 4 marks

Ques	Working	Answer	Mark	Notes
20	$2y - - y = 3 - 6$ **or** $x + 2x = 3 + 12$		3	M1 for a complete method to eliminate one variable (condone one arithmetic error)
				A1 $x = 5$
		$x = 5, y = -1$		A1 $y = -1$ NB: Candidates showing no working score 0 marks
				Total 3 marks

Ques	Working	Answer	Mark	Notes
21a		$8 \times 10 + 1,\ 81,\ 9^2$	2	B2 All three correct (B1 two correct)
b		19	1	B1 cao
ci		$n(n+2)+1$	2	B1 for $n(n + 2) + 1$ on answer line or in table
ii		$(n+1)^2$		B1 for $(n + 1)^2$ on answer line or in table SC : If no marks scored in (i) or (ii) award B1 for $n^2 + 2n + 1$ in (b)
				Total 5 marks

Ques	Working	Answer	Mark	Notes
22	3×8 + 8×10 + 13×18 +18×20 + 23×10 + 28×4 **or** 24 + 80 + 234 + 360 + 230 + 112 **or** 1040		4	M1 finds products $f \times x$ consistently within intervals (inc end points) allow 1 error NB. products do not have to be evaluated
				M1 (dep on first M1) –uses midpoints
	$\frac{3\times8+8\times10+13\times18+18\times20+23\times10+28\times4}{8+10+18+20+10+4}$ **or** "1040" ÷ (8+10+18+20+10+4)			M1 (dep on first M1) $\Sigma fx \div \Sigma f$
		14.9		A1 14.8 − 14.9 or $14\frac{6}{7}$ Accept 15 if full working shown
				Total 5 marks

Ques	Working	Answer	Mark	Notes
23a	$\frac{1}{2}(14+20)\times 8$ **or** $8\times 14+\frac{1}{2}\times 6\times 8$		2	M1 for a complete method
		136		A1
b	$20-14\ (=6)$		4	M1
	'6'^{2} + 8^2 **or** 36 + 64 **or** 100			M1 dep on previous M1
	$\sqrt{('6'^2+8^2)}$			M1 dep on previous M1
		10		A1
				Total 6 marks

Ques	Working	Answer	Mark	Notes
24a		3, 6, 9	1	B1 condone {3, 6, 9}
b		{2,3,4,6,8,9,10}	1	B1 condone omission of brackets
c		{6}	1	B1 condone omission of brackets
d		3, 9	2	B2 cao (B1 for one of 3, 9 with no incorrect numbers **or** 3, 6, 9)
				Total 5 marks

Ques	Working	Answer	Mark	Notes
25a	224 = 2 × 112 = 2×2×56 = 2×2×2×28 = 2×2×2×2×14 2×2×2×2×2×7		3	M1 for at least 2 correct steps in repeated factorisation (may be seen in a tree diagram)
				A1 2, 2, 2, 2, 2, 7 (condone inclusion of 1)
		$2^5 \times 7$		A1 $2^5 \times 7$ NB: Candidates showing no working score 0 marks
b	56 + 32 + 16 56 + 32 + 14 56 + 28 + 16		2	M1 for any 3 correct distinct factors (excluding 1 and 224)
		eg. 56, 32, 16 or 56, 32, 14 or 56, 28, 16		A1 correct and have a sum between 99 and 110
				Total 5 marks

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