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Mark Scheme (Results)

January 2015

Pearson Edexcel International GCSE Mathematics B (4MB0) Paper 01R

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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.

Question	Working	Answer	Mark	Notes
1.	$12-4x-25+5x=104$ (one sign incorrect)		2	M1
		$x = 117$		A1
				Total 2 marks

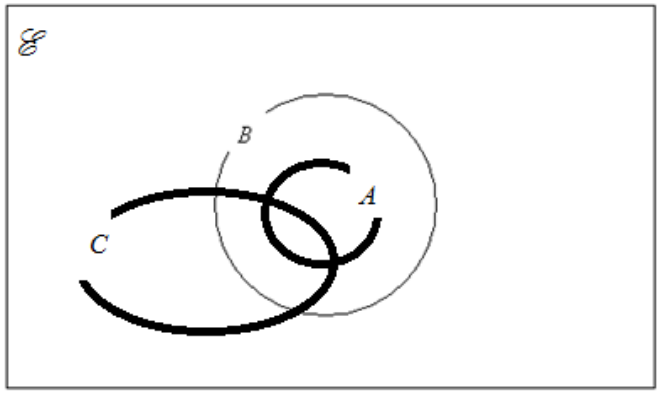
Question	Working	Answer	Mark	Notes
2.	$2y=3x-12$		2	M1
		(gradient =) $\frac{3}{2}$ (oe)		A1
				Total 2 marks

Question	Working	Answer	Mark	Notes
3.	$\frac{\pi}{5}$, $\sqrt[3]{9}$ (or decimal equivalent)		2	B1, B1 **SC:** Award at most B1 B0 if three or more terms given
				Total 2 marks

Question	Working	Answer	Mark	Notes
4.		$\begin{pmatrix}-5\\10\end{pmatrix}$	2	B1 B1
				Total 2 marks

Question	Working	Answer	Mark	Notes
5.	$\frac{(180-38)}{2}$		2	M1
		71		A1
				Total 2 marks

Question	Working	Answer	Mark	Notes
6.	$12xy-9x^2-8y^2+6xy$ (one sign incorrect)		2	M1
		$-9x^2-8y^2+18xy$		A1
				Total 2 marks

Question	Working	Answer	Mark	Notes
7.	*A* is contained entirely in *B* *C* overlaps *A, B and B'* 		2	B1 B1
				Total 2 marks

Question	Working	Answer	Mark	Notes
8.	$\sqrt{12.7\times18}$		2	M1
		15 km (awrt)		A1
				Total 2 marks

Question	Working	Answer	Mark	Notes
9. (a)		1160	3	B1
(b)		1.16×10^3		B1 ft
(c)		1200 (oe)		B1 ft
				Total 3 marks

Question	Working	Answer	Mark	Notes
10.	Either 270/1000 (o.e.) or 30 x 1000 seen		3	B1
	$\frac{270}{1000\times30}\times100$ or $\frac{0.27}{30}\times100$			M1
	0.9 (%)			A1
				Total 3 marks

Question	Working	Answer	Mark	Notes
11.	Using either 2 or -2 substituted into expression		3	M1
	$4(-2)^3+8(-2)^2+(-2)k-18=0$ (o.e.) $(-32+32+-2k-18=0)$			M1 DEP
		k = -9		A1
	OR			
	Attempt at long division of $4x^2+8x^2+kx-18$ by $(x+2)$ or by $(x-2)$			M1
	Dividing by $(x+2)$ giving a quotient of $4x^2+k$			M1 DEP
	k = -9 from completely correct working	k = -9		A1
				Total 3 marks

Question	Working	Answer	Mark	Notes
12. (a)		$y \geq 4$	3	B1
(b)		$x > y$		B1
(c)		$0.32x + 0.25y \leq 3$ or $32x + 25y \leq 300$		B1
				Total 3 marks

Question	Working	Answer	Mark	Notes
13.	$\frac{4(x^2 - 7x + 10)}{2(x-5)}$ or attempt to factorise any of $4x^2 - 28x + 40$, $x^2 - 7x + 10$ or $2x^2 - 14x + 20$		3	M1
	$\frac{4(x-5)(x-2)}{2(x-5)}$ or $\frac{(2x-10)(2x-4)}{2x-10}$ or $\frac{(4x-20)(x-2)}{2x-10}$			M1 DEP
		$2(x-2)$ (o.e.)		A1
				Total 3 marks

Question	Working	Answer	Mark	Notes
14.	(exterior angle =) $180-150$ $\quad \frac{(n-2)\times 180}{n}=150$		3	M1
	$\frac{360}{"180-150"}$			M1 DEP
		12		A1
				Total 3 marks

Question	Working	Answer	Mark	Notes
15.		$2y \,,, \; x+4$ (o.e.)	3	B1
		$y \,,, \; 5-2x$ (o.e.)		B1
		$y \ldots 0$		B1 Accept answers in any order Accept strong inequalities
				Total 3 marks

Question	Working	Answer	Mark	Notes
16. (a)		1	1	B1
(b)	substituting either $x=\frac{5y}{4}$ or $y=\frac{4x}{5}$		2	M1
		$\frac{1}{9}$ (0.111...)		A1
				Total 3 marks

Question	Working	Answer	Mark	Notes
17.	$4^{x-3}=2^{2x-6}$ OR $\frac{4^x}{4^3}=\frac{2^6}{2^x}$		3	M1
	$2x-6=6-x$ OR $8^x=2^6\times4^3$			M1 DEP
		$x = 4$		A1
				Total 3 marks

Question	Working	Answer	Mark	Notes
18.	$\angle ABC=96^0$ or $\angle BCD=112^0$ or $\angle DCE=68^0$		3	B1
	(Oppposite angles of a cyclic quadrilateral)			B1
		16^o		B1
				Total 3 marks

Question	Working	Answer	Mark	Notes
19. (a)	Putting the 7 integers into order or $\frac{13+15}{2}$		2	M1
		14		A1
(b)	$\frac{11+19+15+3+13+7+22+3\times"14"}{8}$		2	M1
		16.5 (o.e.)		A1 ft
				Total 4 marks

Question	Working	Answer	Mark	Notes
20.	$20000 = k \times 20^3$		4	M1
		$k = 2.5$		A1
	$n = "2.5" \times 40^3$			M1 DEP
	OR			
	using a scale factor of any number cubed			M1
		2^3 or $\left(\frac{40}{20}\right)^3$		A1
	20000×2^3			M1 DEP
		160 000 (o.e.)		A1
				Total 4 marks

Question	Working	Answer	Mark	Notes
21.	$5\sqrt{3}$ or $4\sqrt{3}$ or $\sqrt{3600}$ seen		4	M1
	$15 - 5\sqrt{48} + 6\sqrt{75} - 2\sqrt{75}\sqrt{48}$ **OR** $15 - 5 \times 4\sqrt{3} + 6 \times 5\sqrt{3} - 2 \times 5\sqrt{3} \times 4\sqrt{3}$			M1
		-105, $10\sqrt{3}$		A1, A1 (accept $2\sqrt{75}$ or $5\sqrt{12}$ or $\sqrt{300}$ for $10\sqrt{3}$)
				Total 4 marks

Question	Working	Answer	Mark	Notes
22.	$45\times1000\times100$ or $\frac{66}{1000\times100}$		4	M1
	$\frac{45\times1000\times100}{66\times\pi}$ (oe)			M1 DEP
		21702.9…		A1
		22000 (rounding their unrounded value correctly)		A1 ft
	OR			
	$\frac{45\times1000}{60^2}$ $(=0.165876)$			M1
	$\frac{3600}{0.165876}$			M1
		21702.9…		A1
		22000 (rounding their unrounded value correctly)		B1 ft
				Total 4 marks

Question	Working	Answer	Mark	Notes
23.	Either $\frac{10}{3} \le x$ or $x \le \frac{22}{3}$		3	M1
	$\frac{10}{3} \le x$ and $x \le \frac{22}{3}$			M1 DEP
		4, 5, 6, 7		A2 (-1 eeoo)
				Total 3 marks

Question	Working	Answer	Mark	Notes
24.	$\angle BCA = 60^\circ$ or $\angle DCA' = 40^\circ$ or $\angle DCB' = 20^\circ$		5	B1
	$A'D = 7 \times \tan"40"$ (5.87…) **OR** $CD = \frac{7}{\cos 40} = 9.1378...$			M1
	Area of $A'DC = \frac{1}{2} \times "5.87" \times 7$ $(= 20.6...)$			M1
	Area of $CDB' = \frac{7 \times 14}{2} \times \sin"60" - "20.6"$			M1 DEP Award M2 for $\frac{1}{2} \times 14 \times "9.1378..." \times \sin 20$
		21.9 cm^2 (accept 21.8) (awrt)		A1
				Total marks

Question	Working	Answer	Mark	Notes
25.	$x+xt^2=1-t^2$ or $x\left(1+t^2\right)=1-t^2$		5	M1
	$xt^2+t^2=1-x$			M1 DEP
	$t^2(x+1)=1-x$			M1 DEP
	$t^2=\dfrac{1-x}{x+1}$			M1 DEP
		$t=\sqrt{\dfrac{1-x}{x+1}}$		A1
				Total 5 marks

Question		Working	Answer	Mark	Notes
26.	(a)	$x+y+75+116=360$ (o.e.)		1	B1
	(b)	$x=y+37$ (o.e.)		1	B1
	(c)	Correct substitution		3	M1
		$x=103,\quad y=66$			A1, A1
					Total 5 marks

Question	Working	Answer	Mark	Notes
27. (a)	$\tan\angle EAB = \frac{12}{8}$ $\cos\angle EAB = \frac{(4\sqrt{13})^2 + 8^2 - 12^2}{2\times 4\sqrt{13}\times 8}$		2	M1
		56.3°		A1
(b)	$\frac{12}{BD} = \tan 29^\circ$		4	M1
		$BD = 21.6.....$		A1
	$\sqrt{("21.6")^2 - 8^2}$			M1 DEP
		20.1 m		A1
				Total 6 marks

Question	Working	Answer	Mark	Notes
28. (a)	$\frac{4}{9}$ (0.444… , 44.4%)		1	B1
(b)	$"\frac{4}{9}"\times"\frac{3}{8}"$, $\frac{1}{6}$ (oe)		2	M1, A1
	SC: $"4/9"\times"4/9"$			M1 Special case receives M1 A0
(c)	$\frac{3}{9}\times\frac{2}{8}$ and $\frac{2}{9}\times\frac{1}{8}$		3	M1
	$\frac{3}{9}\times\frac{2}{8}+\frac{2}{9}\times\frac{1}{8}+"\frac{1}{6}"$			M1 DEP
		$\frac{5}{18}$ (0.278 , 27.8%)		A1
				Total 6 marks

Question	Working	Answer	Mark	Notes
29. (a)	using $\angle ECD = 90$		2	M1
		10 cm		A1
(b)	$AE \times 8 = 4 \times "10"$ (o.e.)		2	M1
		$AE = 5$ cm		A1 ft
(c)		$AB = 3$ cm	1	B1
(d)	$\sqrt{"3"^2 + (4 + "10")^2}$ or $\sqrt{("5" + 8)^2 + 6^2}$ (diameter)		2	M1
		7.16 cm (awrt)		A1
				Total 7 marks

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