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Mark Scheme (Results)

Summer 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
  - 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	Marks
1	$\frac{22.5}{60}\times 100$ $37.5(\%)$	M1 A1 cao **[2]**

2	$\frac{1}{2}x = 1 - 1.25$	$2x = 4\times 1 - 5$	M1
	$-\frac{1}{2}$ oe		A1 **[2]**

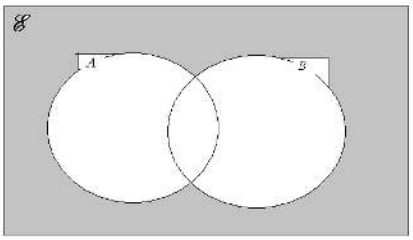
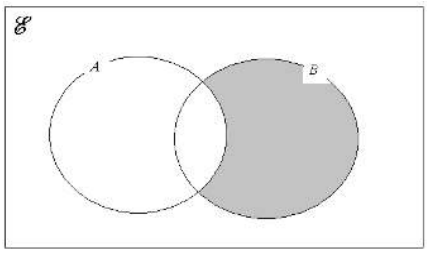
3	Either 3600 or 0.075 seen 48 : 1 or $m = 48$	B1 B1 **[2]**

4	$\frac{4\times 2 + 3\times 3 - 5}{6a}$ (o.e.) $\frac{2}{a}$ oe	M1 A1 **[2]**

5	$y = \frac{x-4}{3}$	$\frac{-1-0}{4-1}$ (o.e.)	M1
	Note: allow one error for method $m = \frac{1}{3}$		A1 **[2]**

6	f(-1)=4 and f(0)=0 and f(1)=-2 $\{4, 0, -2\}$ (in any order)	B1 B1 **[2]**

7	Attempt to factorise quadratic $(2x-3)(x+5)$	M1 A1 **[2]**

8	(a)  (b) 	B1 B1 **[2]**

9	(–3, 5)	B1, B1 **[2]**

10	(a) 2 (b) 4 (or –4)	B1 B1 **[2]**

11	1 hour 42 mins or 102 mins $\frac{2}{3}\times$"102" (68 min) 9:44 (pm)	B1 M1ft A1 **[3]**

12	any one of $3\sqrt{3}$ or $4\sqrt{3}$ or $5\sqrt{3}$ $\frac{3\sqrt{3}+4\sqrt{3}}{5\sqrt{3}}$ 7/5 or 1.4 or $1\frac{2}{5}$	B1 M1 A1 cao **[3]**

13	(a) $\frac{2}{5}$ oe (accept decimal or % equivalent) (b) $\frac{17}{20}$ or 0.85 or "$\frac{2}{5}$"$-\frac{1}{4}$ or $1-(\frac{3}{5}+\frac{1}{4})$ 0.15 or $\frac{3}{20}$ or 15%	B1 M1ft A1 **[3]**
14	$\frac{\frac{1}{2}BC}{12}=\sin 21^\circ$ (o.e.) **Note:** Accept x for $\frac{1}{2}BC$ $\frac{1}{2}BC=12\times\sin 21$ 8.60 (cm) (accept awrt 8.6)	M1 M1 dep A1 **[3]**
15	(a) $x^2+2+\frac{1}{x^2}$, $\frac{x^4+2x^2+1}{x^2}$ **Note:** allow one of the three terms to be incorrect for method $x^2+2+\frac{1}{x^2}$ (fully correct) (b) 7	M1 A1 B1 cao **[3]**
16	42.195×1000, $2\times60\times60+3\times60+23$ (o.e.) $\frac{42.195\times1000}{2\times3600+3\times60+23}$ (o.e.) 5.70 (m/s) (Accept awrt 5.7)	B1, B1 M1 A1 **[3]**

17	(a) (i) 5 (ii) 4.5 (b) $\frac{1+2\times2+3+4+3\times5+6+x}{10}=3\times"5"-"4.5"$ 72	B1 B1 M1ft A1 **[4]**

18	Rearranging ONE side of the inequalities (ignoring equality/inequality sign) $2-3\le 2x$ (oe) eg $-\frac{1}{2}\le x$ AND $2x < 9 - 3$ **Note:** For M marks, accept 0 instead of $-\frac{1}{2}$ $0, 1, 2$ **Note:** A marks dependent on first M mark	M1 M1 dep A2 (-1 eeoo) **[4]**

19	(a) $\angle CAD = 90^\circ$, $\angle ACD = 28^\circ$ **Note**: Accept angles marked on the diagram $\angle CDA = 62^\circ$ (b) $\angle CBA = 180-62$ OR $90+28 = 118$ **NB:** Not ft	B1, B1 B1 B1 ft **[4]**

20	$DC=\sqrt{12^2+5^2}$ $DC = 13$ ($\sqrt{12^2+5^2}$) (13 cm) Area = $"13"\times"13"\times\sin 60^\circ$ 146 (cm^2) (awrt)	M1 A1 M1 dep A1 **[4]**

21	(a)	20, 6, 16	B1, B1, B1
	(b)	numerator = "20"+18+"6"	
		Or denominator = "20"+18+"6"+"16"	M1ft
		$\frac{44}{60}$, $\frac{22}{30}$, $\frac{11}{15}$ (0.733...) ,73.3%	A1
			[5]

22	(a)	125 (m)	B1
	(b)	$125-5t^2=0$	M1
		$t = 5$	A1
	(c)	$(v=)-10\times 2$	M1
		-20 (accept 20)	A1
			[5]

23	**Note:** Penalise incorrect rounding once only in the question, the first time it occurs.		
	(a)	$\frac{75}{360}\times r^2\times\pi=180$	M1
			A1
		r = 16.6 (cm)	
	(b)	$\frac{75}{360}\times 2\times\pi\times$"16.6"	M1
			M1 dep
		+2×"16.6"	
			A1
		54.9 (cm)	
			[5]

24	(a)	$x^2 = y^2 - 3y - 3y + 9$	M1
		$z^2 = y^2 + 2y + 2y + 4$ or $3z^2 = 3y^2 + 6y + 6y + 12$	M1
		$x^2 + 3z^2 - 4y^2 = 6y + 21$	A1
	(b)	$"6y + 21" = 291$	M1
		45	A1 **[5]**

25	(a)	$\frac{1}{3}h(x+4)(x-2) = 120$	M1
		$h = \frac{360}{(x+4)(x-2)}$, $\frac{360}{x^2+2x-8}$	A1
	(b)	$(x+4)(x-2) = 72$ or $5(x+4)(x-2) = 360$	M1
		$x^2 + 2x - 80 = 0$ or $5x^2 + 10x - 400 = 0$	A1
		Attempt to solve a quadratic	M1
		$x = 8$	A1 **[6]**

26	(a)	$1^3 - 3\times1^2 + k + 24 = 0$	M1
		$k = -22$	A1
	(b)	A quotient beginning $x^2 - 2x....$	M1
		Quotient of $x^2 - 2x - 24$	A1
		Attempt to factorise quadratic	M1
		$(x-1)(x+4)(x-6)$	A1 cao **[6]**

27	(a)	$(-1,\ -1)$	B1
	(b)	$\begin{pmatrix} -3 & -5 & -6 \\ 1 & 4 & 2 \end{pmatrix}$	B2(-1 eeoo)
	(c)	$A'B'C''$ drawn	B2 ft
	(d)	Reflection, $x = -1$ (one of these for M1, both for A1)	M1, A1
			[7]

28	(a)	$3y + x = 180$ OR $4x + 2y = 180$ OR $y = 3x$ (any ONE of these equations)	B1
	(b)	ANOTHER of the above equations	B1
	(c)	Either: Balancing equations	M1
		Eliminating x/y	M1 dep
		Or: Making x/y the subject	
		Substituting for x (or y)	
		$x = 18$, $y = 54$	A1, A1
			[6]

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