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Mark Scheme (Results)

Summer 2014

Pearson Edexcel International GCSE in Mathematics B Paper 1R (4MB0/01R)

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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.

- 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  If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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: 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 Number	Answer	Notes	Marks	Total
1	$2x + x + 144 + 90 = 360$ $x = 42$	M1 A1	 2	 2
2	$\frac{1}{3} \times £37.92$ **Note:** Allow $\frac{33.3...}{100}$ (or better) for method £ 12.64 **Note:** Do not isw	M1 A1	 2	 2
3	(a) \$ 2.40 (b) \$ 1.80	B1 B1	1 1	 2
4	$\frac{3x}{2} \times \frac{4(x+2)}{9x}$ or $\frac{12x^2 + 24x}{18x}$ $\frac{2(x+2)}{3}$ or $\frac{2x+4}{3}$ or $\frac{2x}{3} + \frac{4}{3}$	M1 A1	 2	 2
5	Two lines, parallel and equal or greater in length to *AB* and both 2 cm from *AB*. Two semi-circular arcs of radius 2 cm, one centred at *A* and one at *B*	B1 B1	 2	 2
6	Accept any of the following for method: $3(x^2 - 4y^2)$ or $(x-2y)(x+2y)$ or $(3x-6y)(x+2y)$ or $(x-2y)(3x+6y)$ $3(x-2y)(x+2y)$ (cao) **Note:** isw unless goes on to solve an equation	 M1 A1	 2	 2

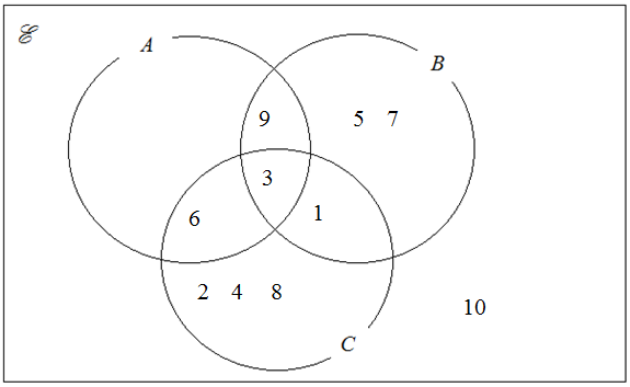
Question Number	Answer	Notes	Marks	Total
7	$\sqrt{9\times 2}$ or $3\sqrt{2}$ or $\sqrt{9}\times\sqrt{2}$ 4 (condone $4\sqrt{2}$) **Note:** Final answer dependent on method seen	M1 A1	2	2
8	$\begin{pmatrix} 12 & -4 \\ -9 & 3 \end{pmatrix}$	B2(-1ee)	2	2
9	One term correctly differentiated $2x-\frac{6}{x^2}$ or $2x-6x^{-2}$ **Note:** Do not isw	M1 A1	2	2
10	$\frac{3}{3+5+7}\times 1050$ or $\frac{7}{3+5+7}\times 1050$ $\frac{7}{3+5+7}\times 1050-\frac{3}{3+5+7}\times 1050$ **Note:** Award M2 for $\frac{4}{3+5+7}\times 1050$ (¥) 280	M1 M1 dep A1	3	3
11	3 (as a numerator) x^2 or y^5 (as a numerator) **Note:** Accept y^{-5} as a denominator $3x^2y^5$ (o.e.) **Note:** Do not isw	B1 M1 A1	3	3
12	$\pi\times r^2\times 4r$ $4r^3=500$ (o.e.) $r=5$	M1 M1 dep A1	3	3

Question Number	Answer	Notes	Marks	Total
13	Removing denominators (allow one slip)	M1		
	$10x-6x-12=5x-10$ (o.e.)	A1		
	$x=-2$	A1	3	3
14	$\frac{85}{360}$ seen	B1		
	$\frac{85}{360}\times\pi\times12^2$	M1		
	107 (cm^2)	A1	3	3
	Note: Accept answer which rounds to required answer			
15	Either $xy+xz-y^2-yz$ or $xy-xz+y^2-yz$	M1		
	$xy+xz-y^2-yz\ -xy+xz-y^2+yz$	M1 dep		
	$2xz-2y^2$ (o.e.)	A1	3	3
	Note: isw			
16	$28+3\times5\le5x+3x$ (o.e.)	M1		
	$\frac{43}{8}\le x$ (o.e.)	A1		
	Note: Accept 5.38 (or better)			
	6	B1ft	3	3
	Note: Final B mark dependent on candidate's $\frac{43}{8}\le x$			

Question Number	Answer	Notes	Marks	Total
17	(a) $(x+35)+(2x-17)=90$ or $(x+35)+(2x-17)+90=180$ $x=24$ (b) $2y+(3y+25)=180$ $y=31$	M1 A1 M1 A1	 2 2	 4
18	(a) $(4,\ -3)$ **Note:** Special Case. Award B1,B0 for $(-4,\ 3)$ (b) $(-2,\ 3)$ **Note:** Accept answers in the form of a column vector in both parts of the question	B1, B1 B1, B1	2 2	 4
19	(a) Either putting the 7 given numbers in order **OR** $\frac{x+14}{2}=12$ 10 (b) $\frac{8+19+14+15+23+6+4+"10"}{8}$ (o.e.) **Note:** Accept $\frac{89+"10"}{8}$ for method 12.4 (12.375) (o.e.) **Notes:** 1. Must see method for ft 2. Accept answers which round to 3 SF	M1 A1 M1 A1 ft	 2 2	 4

Question Number	Answer	Notes	Marks	Total
20	(a) $\frac{360}{75}\times 3075$ (o.e.) or $\frac{3075}{75}=\frac{x}{360}$	M1		
	Note: (o.e.) could be $\frac{285}{75}\times 3075+3075$			
	14760 (cao)	A1	2	
	(b) $\frac{5}{360}\times$"14760" or 5 × "41" (o.e.)	M1		
	or $\frac{5}{360}=\frac{x}{\text{"14760"}}$			
	205	A1	2	4
21	Either			
	$xv=av+b$	M1		
	$xv-av=b$	M1 dep		
	OR			
	$x=a+\frac{b}{v}$ (M1)			
	$x-a=\frac{b}{v}$ (M1 dep)			
	$v(x-a)=b$	M1 dep		
	$v=\frac{b}{x-a}$ or $v=\frac{-b}{a-x}$	A1	4	4

Question Number	Answer	Notes	Marks	Total
22	$ED = 4$ cm **Note:** B1 can be implied in the method mark or marked on the diagram (height =) $\dfrac{7}{\frac{1}{2}\times 4}$ Area of trapezium = $\frac{1}{2}\times "3.5"\times(11+15)$ or $"3.5"\times 11+7$ **OR** Ratio $AE:ED = 11:4$ (B1) Area of ABCE = $\frac{11}{4}\times 2\times 7$ (M1) Area of Trapezium = $"\frac{11}{4}\times 2\times 7"+7$ (M1) 45.5 cm^2	B1 M1 M1 ind A1	4	4
23	$48 = k\times 4^3$ $k = \frac{3}{4}$ (o.e.) $162\times "\frac{4}{3}" = x^3$ (o.e.) **Note:** Award M1,A1,M1 for $\frac{48}{4^3} = \frac{162}{x^3}$ 6 (cao)	M1 A1 M1 dep A1	4	4

Question Number	Answer	Notes	Marks	Total
24				
	3 correctly placed	B1		
	10 correctly placed	B1		
	9,6 and 1 correctly placed	B1		
	5,7 correctly placed	B1		
	2,4,8 correctly places	B1	5	5
	Note: Penalise duplication of 3 and/or duplication of 10			
25	Missing 3 table entries: 22, 48, 20	B1,B1,B1ft		
	Note: Must be an integer value for the ft			
	Height of first bar = 2 (cm)	B1		
	Height of last bar = 2 (cm)	B1ft	5	5
	Note: 1. Widths & position of bars must be correct 2. ft from their table value			

Question Number	Answer	Notes	Marks	Total
26	(a) $FB^2 = 18 \times 32$	M1		
	24	A1	2	
	(b) $r^2 + "24"^2 = (r+16)^2$	M1		
	$r^2 + 576 = r^2 + 32r + 256$	A1		
	OR			
	$32 \times 18 = (2r+16) \times 16$ (M1, A1)			
	OR			
	$24^2 = 16(16 + AC)$ (M1, A1)			
	$r = 10$	A1	3	5
	Note: The candidate could do part (b) before part (a)			
27	(a) $6(1)^3 + 7(1)^2 - 18(1) + 5$	M1		
	0	A1	2	
	Note: Award A1 provided that no incorrect arithmetic is seen			
	OR			
	Dividing the cubic by $(x-1)$ and arriving at a quotient of $6x^2 + 13x...$ (M1)			
	$6x^2 + 13x - 5$ (A1)			
	Note: Allow synthetic division method			
	1 | 6 7 -18 5 0 6 15 -5 6 13			
	(M1)			
	Complete (and correct) third row of table 6, 13, -5 (A1)			

Question Number	Answer	Notes	Marks	Total
	(b) Attempt to divide $6x^3+7x^2-18x+5$ by $(x-1)$	M1		
	$6x^2+13x-5$	A1		
	Notes: 1. For first two marks, accept the synthetic division method again as in part (a).			
	2. $6x^2+13x-5$ seen implies M1, A1			
	$(x-1)(3x-1)(2x+5)$	A1	3	5
	Note: 1. No working seen but an answer of $(3x-1)(2x+5)$ award M1,A1,A0 2. isw			
28	Penalise not corrected **ONCE** only in the question (the first time it occurs).			
	(a) 15°	B1	1	
	(b) Substituted sine rule	M1		
	$\frac{PR}{\sin 25}=\frac{35}{\sin"15"}$ (o.e.)	A1		
	57.2 m (Accept 57.1 m)	A1	3	
	(c) $\frac{PS}{"57.2"}=\sin 40$ (o.e.)	M1		
	Note: PQ = 86.92…. (sine rule)			
	PS = $"86.92"\times\sin 25$ earns M1 here			
	36.7 m (allow 36.8)	A1	2	6

Question Number	Answer	Notes	Marks	Total
29	(a) 4	B1	1	
	(b) One correctly differentiated term	M1		
	$12-3t^2$	A1		
	$"12-3t^2" = 0$	M1 dep		
	$t = 2$	A1	4	
	Note: 1. ± 2 loses the A mark 2. Allow isw			
	(c) $-6t$	M1		
	Note: Award M1 if the candidate has correctly differentiated their $f'(t)$ in part (b) or has correctly differentiated the original $f(t)$			
	-12	A1 ft	2	7
	Notes: 1. ± 12 loses the A mark 2. ft from part (b)			

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