

Mark Scheme (Results)

June 2011

International GCSE
Mathematics (4MB0) Paper 01

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Publications Code UG028414

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4MB0 Summer 2011 - Paper 1

Question Number	Working	Notes		Mark
1.	Common difference of 5 2, 7, 12, 17	M1 A1	 2	 2
2.	$\frac{26-2}{-3-5} \quad \text{OR} \quad \frac{2-26}{5+3}$ OR <u>Solving for m</u> $26 = -3m + c$ $2 = 5m + c$ Full method for obtaining m (no slips) -3	M1 A1	 2	 2
3.	10, 12, 14	B2 (-1eeoo)	2	2
4.	$3 + 20 = 8x$ (rem. denom. and x isolated, one arithmetical slip) $2\frac{7}{8} \quad \text{OR} \quad 2.875 \quad \text{OR} \quad 2.88 \quad \text{OR} \quad \frac{23}{8}$	M1 A1	 2	 2
5.	3 or 7 identified as a common factor 21	M1 A1	 2	 2
6.	$x(x-y) + z(x-y) \quad \text{OR} \quad x(x+z) - y(x+z)$ (no slips) $(x+z)(x-y)$	M1 A1	 2	 2
7.	$\frac{55.43}{115} \times 100 \quad \text{OR} \quad 55.43/1.15 \quad \text{OR} \quad 55.43 \times \frac{20}{23}$ £ 48.20	M1 A1	 2	 2
8.	$\frac{x(x+2)-2x}{2(x+2)} \quad \text{OR} \quad \frac{x^2+2x-2x}{2x+4}$ OR $\frac{x(x+2)}{2(x+2)} - \frac{2x}{2(x+2)} \quad (\text{no slips})$ $\frac{x^2}{2(x+2)} \quad \text{OR} \quad \frac{x^2}{2x+4}$	M1 A1	 2	 2
9.	One term correctly differentiated $6x^2 + 12x^{-5}$	M1 A1	 2	 2

Question Number	Working	Notes		Mark
10.	$\angle BDA = 59^\circ$ and $\angle ABD = 59^\circ$ $\angle$ in same segment for one of above angles Cc inc. reason for an isos Δ NB: The last B mark is dependent on the previous two.	B1 B1 B1	3	3
11.	$24 - 3x < 20$ (Rem. denom., one arithmetical slip) NB: Use of “=” instead of inequality: award M1 once the correct inequality has been indicated eg in line below $4 < 3x$ (o.e) 2 OR <u>Trial and error</u> Subs $x = 1$ and $x = 2$ into $6 - \frac{3x}{4}$ Correctly (st $x = 1 \rightarrow 5.25$ and $x = 2 \rightarrow 4.5$) 2	M1 A1 A1 M1 A1 A1	 3 3	 3 3
12.	$540/5$ (108) “108” $\times 12$ (o.e.) Other Possible Methods: $\frac{2}{12}N$ and $\frac{7}{12}N$ $\frac{5}{12}N = 540$ OR $S =$ smallest share, $L =$ largest share Use of $\frac{S}{2}$ OR $\frac{L}{7}$ $\frac{S}{2} = \frac{S+540}{7}$ OR $\frac{L}{7} = \frac{L-540}{2}$ £ 1296	B1 M1 B1 M1 B1 M1 A1	 3	 3
13.	Using 4.5 $\frac{1}{2}\pi \cdot 9^2 - \pi \cdot “4.5”^2$ 63.6 cm^2	B1 M1 A1	 3	 3

Question Number	Working	Notes		Mark
14.	$\vec{AB} = \begin{pmatrix} 6 \\ -8 \end{pmatrix} \text{ (or } \vec{BA} = \begin{pmatrix} -6 \\ 8 \end{pmatrix})$ $\sqrt{6^2 + 8^2}$ 10 (from completely correct working)	B1 M1 A1	3	3
15.	240 OR 6x40 OR 48 (can be implied) $3x + 102 + 60 + 30 = \text{"240"}$ OR $\frac{192 + 60 + 30 + 3x}{6} = 40$ 16	B1 M1 A1	3	3
16.	$AX \cdot 3 = 12 \times 4$ (o.e) $AX = 16$ $AO = (\text{"16"} + 3)/2 = 9.5 \text{ cm}$ OR $(r = AO): (2r-3) \times 3 = 12 \times 3, \quad 6r = 57 \quad (1 \text{ slip})$ $(x = OX): 3 \times (x+3+3) = 12 \times 3, \quad x = 6.5$ $AO = 9.5 \text{ cm}$	M1 A1 A1 ft M1, A1 M1, A1 A1 ft	3 3	3 3
17.	2, 9 or 11 seen $\frac{2+9}{11}$ (allow one numerical error) 1	B1 M1 A1	3	3
18.	(x = exterior angle) $8x + x = 180^\circ$ OR $8\left(\frac{360}{n}\right) + \left(\frac{360}{n}\right) = 180$ (o.e) $x = 20$ OR $\text{"3240} = 180n\text{"}$ $360/\text{"20"}$ OR $\text{"3240}/180\text{"}$ $n = 18$ OR (e = interior angle) $e = 8 \times (180 - e)$ $e = 160$ $n = \frac{360}{180 - \text{"160"}}$ $n = 18$	M1 A1 M1 DEP A1 M1 A1 M1 DEP A1	4 4	4 4

Question Number	Working	Notes		Mark
19.	$(\sqrt{512} =) 16\sqrt{2}$ OR $8\sqrt{8}$	B1		
	$(\sqrt{72} =) 6\sqrt{2}$ OR $3\sqrt{8}$	B1		
	$10\sqrt{2}$	B1		
	10	B1	4	4
20.	$7^2 = 4^2 + 5^2 - 2 \cdot 4 \cdot 5 \cdot \cos A$	M1		
	$2 \times 4 \times 5 \times \cos A = 4^2 + 5^2 - 7^2$	M1		
	$\cos A = (4^2 + 5^2 - 7^2) / (2 \times 4 \times 5) \quad (= -\frac{8}{40} = -0.2)$ o. NB: Allow <u>1</u> sign slip in the above 3 M marks	M1 dep		
	$= 102^\circ, 258^\circ, 462^\circ, \dots$	A1	4	4
21.	(a) correctly labelled line (line going through (0, -5) and (4, 3)) or correct gradient plus line going through (2.5, 0))	B1	1	
	(b) correctly labelled line (line going though (0, 4) and (4, 0) or correct gradient plus line going through (4, 0)) NB: (1) Penalise labelling once . (2) The lines must be sufficiently long to identify their intersection in (c)	B1	1	
	(c) $x = 3$ $y = 1$ NB: (1) Above values must be from their diagram. (2) Accept (3, 1)	B1 ft B1 ft	2	4
22.	(a) $1/3$ OR 0.333 OR 33.3%	B1	1	
	(b) 2, 3, 5, 7, 11	B1	1	
	(c) correct diagram (ft on "(b)")	B1 ft	1	
	(d) "15"/36 OR " $\frac{5}{12}$ " OR "0.417" OR "41.7%" (ie ft on "15" circled outcomes in (c))	B1 ft	1	4
23.	(a) $\begin{pmatrix} 17 & 12+4a \\ 6+2a & 8+a^2 \end{pmatrix}$	B2(-1ee)	2	
	(b) $a = -3,$ $\lambda = 17$	B1 B1	2	4

Question Number	Working	Notes		Mark
24.	Heights: 4.8, 7.2, 6.4, 1.1 OR 24, 36, 32, 5.5	B1, B1, B1 B1	4	4
25.	(a) attempt at construction (3 sets of arcs seen), accuracy (b) attempt at construction (2 sets of arcs seen) accuracy (c) 60 (± 1) mm	M1 A1 M1 A1 B1	2 2 1	5
26.	(a) $\frac{1}{2} \times \frac{1}{2} x \times [x + (x + 4)]$ $\frac{1}{4} x(2x + 4)$ OR $\frac{1}{2} x(x + 2)$ OR $0.5x^2 + x$ (b) “ $2x^2 + 4x = 4 \times 84$ ” (o.e) $x^2 + 2x - 168 = 0$ (o.e. ie a quadratic but c.a.o) $(x + 14)(x - 12) = 0$ (o.e, method for solving 3 term quadratic) $x = 12$ (c.a.o)	M1 A1 M1 A1 M1 (INDEP) A1	2 4	6
27.	$\frac{1}{3} + \frac{1}{5} + \frac{1}{4} \left(= \frac{47}{60} \right)$ “13x/60” = 26 120 OR “13/60” = 26 blue sweets (1/60 = 26/13 $\Rightarrow$ 2) 40 (Red) 24 (Yellow) 30 (Green)	M1 M1 A1 M1 A1 A1 A1 A1	6	6

Question Number	Working	Notes		Mark
28.	(a) three terms, at least one correctly differentiated	M1	2	6
	$15 + 4t - 3t^2$	A1		
	(b) “(a)” = 0	M1		
	$t= 3$ c.a.o from a correct eq ⁿ	A1		
	$s(“3”)$	M1 DEP		
	36	A1		
29.	NB: Penalise ncc ONCE only in this question	M1	4	6
	(a) $10/AD = \sin 26^\circ$	A1		
	22.8 cm			
	(b) $16/“22.8” = \tan \angle CAD$	M1		
	$35.0^\circ/35.1^\circ$ (accept 35)	A1		
	(c) any correct trig/Pythagorean method for AC			
	Eg $\sin “35.0” = \frac{16}{AC}$ OR $AC^2 = 16^2 + “22.8”^2$ (AC = 27.86)	M1		
	$\frac{AB}{“27.86”} = \cos “29.0”$	M1 DEP		
	OR $\sin(26 + “35.0”) = \frac{AB}{“27.86”}$			
	OR Extend <i>BC</i> to <i>G</i> so that <i>BG</i> is perpendicular to <i>EG</i> $DG = 16 \times \cos 26$ $AB = 10 + “16 \times \cos 26”$	M1 M1 DEP		
	24.3/24.4 cm	A1		

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