Mark Scheme (Results)

June 2011

International GCSE
Mathematics (4MB0) Paper 01

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

Question Number	Working	Notes		Mark
10.	$\angle BDA$ = 59° **and** $\angle ABD$ = 59° $\angle$ 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 - $\dfrac{3x}{4}$ Correctly (st x = 1 -> 5.25 and x = 2 -> 4.5) 2	M1 A1 A1 M1 A1 A1	 3 3	 3 3
12.	540/5 (108) "108" x 12 (o.e.) **Other Possible Methods:** $\dfrac{2}{12}N$ and $\dfrac{7}{12}N$ $\dfrac{5}{12}N = 540$ **OR** S = smallest share, L = largest share Use of $\dfrac{S}{2}$ OR $\dfrac{L}{7}$ $\dfrac{S}{2} = \dfrac{S+540}{7}$ OR $\dfrac{L}{7} = \dfrac{L-540}{2}$ £ 1296	B1 M1 B1 M1 B1 M1 A1	 3	 3
13.	Using 4.5 ½π . 9^2 - π . "4.5"^{2} 63.6 cm^2	B1 M1 A1	 3	 3

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

Question Number	Working	Notes		Mark
19.	$(\sqrt{512} =)$ 16√2 **OR** 8√8	B1		
	$(\sqrt{72} =)$ 6√2 **OR** 3√8	B1		
	10√2	B1		
	10	B1	4	4
20.	$7^2 = 4^2 + 5^2 - 2.4.5.\cos A$	M1		
	$2x4x5x\cos A = 4^2 + 5^2 - 7^2$	M1		
	$\cos A = (4^2 + 5^2 - 7^2)/2x4x5$ $(= -\dfrac{8}{40} = -0.2)$ o.	M1 dep		
	NB: Allow **1** sign slip in the above 3 M marks			
	$= 102°, 258°, 462°, …$	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** "$\dfrac{5}{12}$" **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

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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) $\dfrac{1}{2}\times\dfrac{1}{2}x\times[x+(x+4)]$
	
	     $\dfrac{1}{4}x(2x+4)$ **OR** $\dfrac{1}{2}x(x+2)$ **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.	$\dfrac{1}{3}+\dfrac{1}{5}+\dfrac{1}{4}\ \left(=\dfrac{47}{60}\right)$ "$13x/60$" = 26 120 **OR** "$13/60$" = 26 blue sweets $(1/60 = 26/13 =) 2$ 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		
		A1	2	
	$15 + 4t - 3t^2$			
	(b) "(a)" = 0	M1		
	$t= 3$ c.a.o from a correct eq^n	A1		
	s("3")	M1 DEP		
	36	A1		
			4	6
29.	**NB:** Penalise ncc **ONCE** only in this question	M1		
	(a) 10/AD = sin 26°			
		A1	2	
	22.8 cm			
	(b) 16/"22.8" = tan $\angle$ CAD	M1		
	35.0°/35. 1° (accept 35)	A1	2	
	(c) any correct trig/Pythagorean method for AC			
	Eg $\sin"35.0" = \dfrac{16}{AC}$ **OR** $AC^2 = 16^2 + "22.8"^2$ (AC = 27.86)	M1		
	$\dfrac{AB}{"27.86"}$ = cos "29.0"	M1 DEP		
	OR $\sin(26+"35.0") = \dfrac{AB}{"27.86"}$			
	OR Extend BC to G so that BG is perpendicular to EG DG = 16 x cos 26 AB = 10 + "16 x cos 26"	M1 M1 DEP		
	24.3/24.4 cm	A1	3	7

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