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Mark Scheme (Results)

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International GCSE
Mathematics (4MB0) Paper 01

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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.	$\frac{26-2}{-3-5}$ **OR** $\frac{2-26}{5+3}$ **OR** *Solving for m* 26 = -3*m* + *c* 2 = 5*m* +c Full method for obtaining *m* (no slips) -3	M1 M1 A1	 2	 2
3.	10, 12, 14	B2 (-1eeoo)	2	2
4.	3 + 20 = 8*x* (rem. denom. and *x* isolated, one arithmetical slip) $2\frac{7}{8}$ **OR** 2.875 **OR** 2.88 **OR** $\frac{23}{8}$	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*) **OR** x(x + z) - y(x + z) (no slips) (*x* + z)(*x* - *y*)	M1 A1	 2	 2
7.	$\frac{55.43}{115}\times 100$ OR 55.43/1.15 OR $55.43\times\frac{20}{23}$ £ 48.20	M1 A1	 2	 2
8.	$\frac{x(x+2)-2.x}{2(x+2)}$ **OR** $\frac{x^2+2x-2x}{2x+4}$ OR $\frac{x(x+2)}{2(x+2)}-\frac{2x}{2(x+2)}$ (no slips) $\frac{x^2}{2(x+2)}$ OR $\frac{x^2}{2x+4}$	M1 A1	 2	 2
9.	One term correctly differentiated $6x^2 + 12x^{-5}$	M1 A1	 2	 2

Question Number	Working	Notes		Mark
10.	$\angle BDA = 59°$ **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 $6 - \frac{3x}{4}$ 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:** $\frac{2}{12}N$ 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 $\frac{1}{2}\pi . 9^2 - \pi . "4.5"^2$ 63.6 cm^2	B1 M1 A1	3	3

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

Question Number	Working	Notes		Mark
19.	($\sqrt{512}$ =) 16√2 **OR** $8\sqrt{8}$ ($\sqrt{72}$ =) 6√2 **OR** $3\sqrt{8}$ 10√2 10	B1 B1 B1 B1	4	4
20.	$7^2 = 4^2 + 5^2 - 2.4.5.\cos A$ $2x4x5x\cos A = 4^2 + 5^2 - 7^2$ cos *A* = $(4^2 + 5^2 - 7^2)/2x4x5$ (= $-\frac{8}{40}$ = -0.2) o. **NB:** Allow **1** sign slip in the above 3 M marks = 102°, 258°, 462°, …	M1 M1 M1 dep 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)) (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) (c) *x* = 3 *y* = 1 **NB:** (1) Above values **must** be from their diagram. (2) Accept (3, 1)	B1 B1 B1 ft B1 ft	1 1 2	4
22.	(a) 1/3 **OR** 0.333 **OR** 33.3% (b) 2, 3, 5, 7, 11 (c) correct diagram (ft on "(b)") (d) "15"/36 **OR** "$\frac{5}{12}$" **OR** "0.417" **OR** "41.7% (ie ft on "15" circled outcomes in (c))	B1 B1 B1 ft B1 ft	1 1 1 1	4
23.	(a) $\begin{pmatrix} 17 & 12+4a \\ 6+2a & 8+a^2 \end{pmatrix}$ (b) *a* = -3, λ = 17	B2(-1ee) B1 B1	2 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 x 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 =) 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		
	$15 + 4t - 3t^2$	A1	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 $\sin"35.0" = \frac{16}{AC}$ **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 BC to G so that BG is perpendicular to EG	M1		
	DG = 16 x cos 26	M1 DEP		
	AB = 10 + "16 x cos 26"			
	24.3/24.4 cm	A1	3	7

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