MARK SCHEME for the October/November 2013 series

0581 MATHEMATICS

0581/22

Paper 2 (Extended), maximum raw mark 70

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.



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Abbreviations

cao	correct answer only
cso	correct solution only
dep	dependent
ft	follow through after error
isw	ignore subsequent working
oe	or equivalent
SC	Special Case
WWW	without wrong working
soi	seen or implied
	*

Qu.	Answers	Mark	Part Marks
1	19% 0.719 ⁵ $\sqrt{0.038}$ sin 11.4 1/5	2	B1 for decimals [0.19], [0.2], 0.194, 0.197, 0.192 seen
			Or for four in correct order
2	(a) -447	1	
	(b) 2	1	
3	15.7 or 15.70 to 15.71	2	M1 for $2 \times \pi \times 2.5$
4	160	2	M1 for $\frac{8}{18} \times 360$ oe
5	(a)	1	
	(b) Some possible answers:	1	
6	$[\pm]\sqrt{y-4}$ final answer	2	M1 for first move completed correctly M1 for second move completed correctly on answer line
7	170	2	M1 for $\frac{1}{2} \times (12 + 22) \times 10$ oe
8	3619 to 3620	2	M1 for $\frac{1}{2} \times \frac{4}{3} \times \pi \times 12^3$ or better
9	decagon	3	M1 for 360 ÷ 36 oe A1 for 10
10	10.1[0]	3	M1 for 1.3199 and 1.3401 seen and M1 for 500 × 1.3199 or 500 × 1.3401 or for 500 × (<i>their</i> highest – <i>their</i> lowest) oe
11	120	3	M1 for $v = \frac{k}{\sqrt{d}}$ A1 for $k = 600$

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12	p = 71.4025 cao q = 73.1025 cao	3	B1 for 8.45 and 8.55 seen M1 for <i>their</i> LB ² $[\pi]$ or <i>their</i> UB ² $[\pi]$ If 0 scored, SC1 for one correct.		
13	10[.00]	3	M2 for 1.90 and 2.90 and 5.20 only or M1 for two of 1.90, 2.90, 5.20 in a list of three or two values from the table or SC1 FOR 1.90, 2.90, 4.30 $\left[\text{from } \frac{3.40 + 5.20}{2} \right]$		
14	52	3	B2 for $AOB = 104$ or B1 for OAB or $OBA = 38$		
15	(8, 2)	3	M1 for correctly eliminating one variable A1 for $x = 8$		ariable
			A1 for $y = 2$ If 0 scored, SC	2 for correct substit find the other value.	ution and correct
16	x <6.8	4	Or M1 for first m and M1 for sec	n wrong inequality o ove completed corre cond move complete rd move completed	ctly ed correctly
17	(a) $\begin{pmatrix} 11 & 5 \\ 26 & 30 \end{pmatrix}$	2	2 SC1 for one correct row or colu		1
	(b) $\frac{1}{8} \begin{pmatrix} 6 & -1 \\ -4 & 2 \end{pmatrix}$ oe	2	B1 for $k \begin{pmatrix} 6 \\ -4 \end{pmatrix}$ or B1 for $\frac{1}{8} \begin{pmatrix} a \\ c \end{pmatrix}$		
18	(a) (1.5, 12.5) oe	2	B1 for either c	oordinate	
	(b) $y = 3x + 8$ oe	3	or B1 for grad	+ 8 or $y = 3x + c$ or 2 ient (or m) = 3 and E or for 23 = their $m \times$ or for 2 = their $m \times$ r for 12.5 = their $m \times$	B1 for $c = 8$ 5 + c 5 - 2 + c
	(c) Most common methods: Correctly substituting $P(3, 17)$ into y = 3x + 8 Showing the gradient of AP or $BP = 3$ Other methods possible.	1			

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19	(a) $-2a - 2c$ oe		2	M1 for BO = $-\mathbf{a} - \mathbf{c}$ or for any correct route or correct unsimplified expression				
	(b) 2 a + c		2	M1 for any con expression	rrect route or correc	t unsimplified		
	(c) -a - c oe		2FT	 FT <i>their</i> (a) or correct answer Or M1 for a correct non direct route from O to correct unsimplified expression or for correct H unsimplified 				
20	(a) 4.05 to 4.2	2	1					
	(b) 2.6 to 2.75	5	2	B1 for 9.6 seer	1			
	(c) 2.05 to 2.2	25	2	B1 for [UQ] 5.0 to 5.1 and [LQ] 2.85 to 2.95 see				
	(d) $\frac{5}{48}$		2	M1 for 5				
21	(a) 37.2 or 37	.17 to 37.19	3	6				
	(b) 11.7 or 11	.72 to 11.74	3		$\frac{1}{3} = \frac{6}{\sin 65}$ oe $60 - 65 - their (a)$ $\times 6 \times \sin their 77.8$			