CAMBRIDGE INTERNATIONAL EXAMINATIONS Cambridge International General Certificate of Secondary Education

## MARK SCHEME for the October/November 2014 series

## **0580 MATHEMATICS**

0580/23

Paper 2 (Extended), maximum raw mark 70

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## Abbreviations

cao	correct answer only
	-
dep	dependent
FT	follow through after error
isw	ignore subsequent working
oe	or equivalent
SC	Special Case
nfww	not from wrong working

soi seen or implied

Qu.	Answers	Mark	Part Marks		
1	2870	2	<b>M1</b> for 350 × 8.2		
2	$0.34  0.7^3  0.6^2  \sqrt{0.6}$	2	<b>M1</b> for decimal conversion: 0.7 [7] or 0.8 for $\sqrt{0.6}$ and 0.36 for 0.6 <sup>2</sup> and 0.343 for 0.7 <sup>3</sup> or <b>B1</b> for three in the correct order		
3	$2.4 \times 10^{8}$	2	<b>B1</b> for 240 000 000 oe or <b>B1</b> for $k \times 10^8$ or $2.4 \times 10^k$		
4	30	2	<b>M1</b> for $2x + 3x + 4x + 90 = 360$ oe		
5	48	2	<b>M1</b> for 52 ÷ 65 [× 60] oe implied by 0.8		
6	9.5 or $\frac{19}{2}$	3	<b>M2</b> for $2x = (8 \times 3) - 5$ or better oe or <b>M1</b> for $2x + 5 = 8 \times 3$ or better		
7	160	3	M2 for $180 - \frac{360}{18}$ or $\frac{180 \times (18 - 2)}{18}$ oe or M1 for $180 \times (18 - 2)$ or $\frac{360}{18}$		
8	$8 + (y-2)^2$ oe final answer	3	M1 for $y - 2 = \sqrt{(x - 8)}$ M1 for squaring both sides completed correctly M1 for adding <i>their</i> 8 completed correctly on answer line		
9	4	3	M2 for $6(3+5) = y(7+5)$ oe or M1 for $y = \frac{k}{x+5}$ oe A1 for $k = 48$		
10	13891.5[0]	3	M2 for $12000 \times \left(1 + \frac{5}{100}\right)^3$ oe or M1 for $12000 \times \left(1 + \frac{5}{100}\right)^n$ oe $n \ge 2$		

Pa	ge 3		Schem		Syllabus	Paper
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11	(a)	608 400 cao	2	<b>M1</b> for $\frac{1}{4} \times 39^2 \times (39+1)^2$		
	(b)	$2n^2(n+1)^2$ oe	1			
12	(a)	Complete circle centre <i>E</i> radius 3cm	1			
	(b)	Correct ruled bisector with two pairs of correct arcs	2	<b>B1</b> for correct bisector with no	/wrong arcs	
	(c)		1	dep on attempt at bisector of C	and enclosed	d region
13		$\frac{16x^2 + 18x + 9}{6x}$ final answer	4	M2 for 9 [+] $4x^2$ [+] $18x$ [+] 12 or M1 for 2 of these and M1FT for adding their fou together correctly and B1 for denominator $6x$ to a maximum of 3 marks		's'
14	(a)	$\frac{1}{2}\mathbf{b} - \frac{1}{2}\mathbf{a}$ oe	2	M1 for $\frac{1}{2}(\overrightarrow{AO} + \overrightarrow{OB})$ oe or co route e.g. $\overrightarrow{AO} + \overrightarrow{OB} + \overrightarrow{BP}$ or $-\mathbf{a} + \mathbf{b} + \frac{1}{2} \overrightarrow{BA} = -\mathbf{a} + \mathbf{b} + \mathbf{b}$		lified
	(b)	$\frac{1}{4}\mathbf{a} + \frac{3}{4}\mathbf{b}$ oe	2	<b>M1</b> for $\overrightarrow{OA} + \overrightarrow{AQ}$ oe or corre	ct unsimplifie	ed route
15	(a)	19 2 1 8	2	<b>B1</b> for any two correct		
	(b)	1 8 19 2	2FT	<b>B2FT</b> for a correct ft from ( <b>a</b> ) or <b>B1FT</b> for any two correct o from ( <b>a</b> )	r for any corr	ect two ft
16	(a)	64	2	<b>B1</b> for $[f(1) = ] 4$ or <b>M1</b> for $((x - 3)^2)^3$ or better		
	(b)	4x + 1 oe	2	<b>M1</b> for $x = \frac{y-1}{4}$ or $4y = x - $	1	
	(c)	$\frac{x^3-1}{4}$ of final answer	1			
	( <b>d</b> )	3 nfww	1			

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17	(a)	3.08 to 3.22 nfww	2	<b>B1</b> for 502.5 to 502.62 or 505.7 to 505.8			
	(b)	$\frac{16}{200}$ oe	2	<b>B1</b> for 16 soi or <b>M1</b> for $\frac{their 16}{200}$			
	(c)	18.5 26 3	2	<b>B1</b> for 18.5 and 26 <b>B1</b> for 3			
18	(a)	3	4	<b>B3</b> for 3.536 to 3.54 as an answer or <b>M2</b> for $2000 \div \frac{1}{3}\pi \times 6^2 \times 15$			
				or <b>M1</b> for $\frac{1}{3}\pi \times 6^2 \times 15$ and <b>SC1</b> for truncating <i>their</i> 3	.54 to a whole	e number	
	(b)	303 to 304	3	M2 for 2000 – <i>their</i> 3 × <i>their</i> or M1 for <i>their</i> 3 × <i>their</i> volu			
19	(a)	rotation 90 clockwise [about] origin oe	3	<b>B1</b> for each			
	(b)	$\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$	2	M1 for any one column or row	v correct		
	(c)	Triangle at (3, 3), (6, 3) and (3, 5)	2	M1 for any two vertices corre translated horizontally	ct or correct a	nswer	