## MARK SCHEME for the October/November 2013 series

## 0580 MATHEMATICS

0580/21

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.

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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

Qu.	Answers	Mark	Part Marks		
1	86.7 or 86.74 to 86.75	1			
2	5.293 cao	2	<b>B1</b> for 5.29 or 5.292 to 5.2927		
3	125	2	<b>B1</b> for 55 or 125 in any other correct position on diagram or <b>M1</b> for 180–55		
4	7.7	2	<b>M1</b> for $44 \times \frac{17.5}{100}$ oe		
5	4.8 oe	2	M1 for $5 + 19 = 3x + 2x$ oe or better or B1 for $24 - 2x = 3x$ oe or $5 = 5x - 19$ oe		
6	(a) $\frac{2}{6}$ oe	1			
	<b>(b)</b> 200	1FT	FT 600 × <i>their</i> (a) providing <i>their</i> (a) is a probability		
7	435, 445 cao	2	<b>B1</b> for one value in the correct place or <b>SC1</b> for both values correct but reversed		
8	134	3	M2 for $\frac{20.1 \times 100}{3 \times 5}$ oe or M1 for $\frac{x \times 3 \times 5}{100} = 20.1$ or 3% = 4.02 oe If 0 scored SC1 for answer of figs 134		
9	(a) $\frac{n}{n+2}$ of final answer	1			
	<b>(b)</b> $n^2 - 1$ oe final answer	2	<b>B1</b> for any quadratic in final answer		
10	$[\pm]\sqrt{c^2-a^2}$ oe final answer	3	M1 for correct square M1 for correct re-arrangement M1 for correct square root		

Pa	ge 3	Mark Scheme			Syllabus	Paper
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11	150		3	<b>M1</b> for m <sup>3</sup> to cm <sup>3</sup> or cm <sup>3</sup> to m <sup>3</sup>		
12	<b>(a)</b> 110		1			
	<b>(b)</b> 79		2	<b>B1</b> for $DAC = 42$ or $ACB = 79$ or $ACD = 28$		
13	(a) $\frac{5}{4}$ o	e	1			
	<b>(b)</b> 4y <sup>6</sup>		2	B1 for <i>k</i>	$y^6$ or $y^6$ or $4y^k$ or 4	as final answer
14	$\frac{2t-5}{t-1} f$	inal answer	3	<b>B1</b> for $\frac{3(t-1)}{t-1}$ or better <b>B1</b> for $3(t-1) - (t+2)$ oe or better		
15	(a) $\frac{9}{12}$	$-\frac{1}{12}$ oe	M1	Must be shown		
	$[=]\frac{8}{12}$	$\frac{3}{2}$ oe $[=]\frac{2}{3}$	M1	Both fractions must be shown		
	<b>(b)</b> $\frac{5}{2} \times$	20	M1	Must be shown		
	Can	celling shown or $\frac{20}{50}$ oe $[=]\frac{2}{5}$	M1	<b>Dependent</b> and cancelling shown or a fraction and then $\frac{2}{5}$ must be shown		
16	(a) $\begin{pmatrix} 9 \\ 6 \end{pmatrix}$		1			
	<b>(b)</b> 10.8	or 10.81 to 10.82	2FT		$\sqrt{(their 9)^2 + (their 0.8 \text{ or FT correctly})^2}$	
	(c) (17,	13)	1FT	FT <i>their</i> 9 and 6. (8 + <i>their</i> 9, 7 + <i>their</i> 6) correctly evaluated		
17	(a) ( <i>a</i> +	b)(1+t)	2	<b>B1</b> for $1(a + b) + t(a + b)$ or $a(1 + t) + b(1 + t)$		
	<b>(b)</b> ( <i>x</i> –	6)(x+4)	2		answer of $(x + a)(x + a) = -2$	(x + b) where
18	486 cao		4	A1 for [	$\frac{1}{2} \times 4\pi r^{2} + \pi r^{2} = 24$ r = ] 9 $\frac{1}{2} \times \frac{4}{3} [\pi] (\text{their } r)^{3}$	$43\pi$ or better

Pa	age 4 Mark Scheme			Syllabus	Paper	
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			1	1		
19	<b>(a)</b> 40		2	M1 for	$\frac{144 \times 1000}{60 \times 60}$ oe	
	<b>(b)</b> 3.5		2FT	FT 140 ÷ their (a) M1 for dist ÷ their (a) or dist ÷ 40 or dist × $\frac{60 \times 60}{144 \times 1000}$ or B1 for 140 seen		
20	(a) (i)	Accurate bisector of angle <i>B</i> with correct arcs	2	<b>B1</b> for c	orrect line or correct	ct arcs
	(ii)	Accurate perpendicular bisector of <i>BC</i> with correct arcs	2	B1 for c	orrect line or correct	ct arcs
	(b) corr	ect region shaded	1			
21	<b>(a)</b> 73.7	or 73.73 to 73.74	3	<b>M1</b> for $\frac{20}{3+2} \times 2$ or <b>B1</b> for $BX = 8$		
				M1 for t	$\tan\left[\right] = \frac{6}{their \ 8} \text{ or }$	better
	(b) 120		2	M1 for	$\frac{1}{2} \times 20 \times 12$ oe	
22	(a) (i)	$\frac{5}{50}$ oe	1			
	(ii)	$\frac{11}{50}$ oe	1			
	<b>(b)</b> $\frac{11}{16}$	oe	1			
	(c) $\frac{380}{245}$	$\frac{0}{0}$ oe	2	M1 for	$\frac{20}{50} \times \frac{19}{49}$	
	(d)		1			