MARK SCHEME for the October/November 2013 series

0580 MATHEMATICS

0580/31

Paper 3 – Core maximum raw mark 104

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.

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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 workin	g
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	Qu.	Answers	Mark	Part Marks
1	(a) (i)	36 cao	1	
	(ii)	5, 2, 3, 4, 3, 8, 1, 4	2	B1 for 6 or 7 frequencies correct or 8 correct tallies if frequency column blank or 8 correct frequencies in tally column
	(iii)	fully correct bar chart	3FT	 B1 for a correct linear scaled frequency axis B2FT for correct height and equal width of bars or B1FT for correct height of at least 5 bars or all bars correct height but unequal widths or gaps SC2 for a fully correct bar chart but linear scale not marked
	(iv)	26 – 30 cao	1	
	(b)	7 (hours) 25 (minutes) cao	1	
	(c) (i)	238.48	2	M1 for 167 × 1.428 soi by 238.47(6) or 238.5 or 238
	(ii)	75	2	M1 for 107.1 ÷ 1.428
2	(a) (i)	2, 3, 4, 5, 6, 8, 10, 12, 15, 20, 24, 30, 40, 60.	1	Award mark for any one from list.
	(ii)	60	2	B1 for any common factor on answer line, 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30
	(b) (i)	60	1	
	(ii)	49	1	
	(iii)	2	1	
	(c) (i)	Any correct example	1	Calculation and correct answer must be seen

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	(ii)	A	ny correct example	1	Calculation and correc seen	t answer must be
	(d) (i)	>		1		
	(ii)	>		1		
	(iii)	<		1		
3	(a) (i)	44	4 – 46	1		
	(ii)	23	31 – 235	1		
	(b) (i)	Fı	ally correct drawing with arcs	3	B2 for correct triangle B1 for 1 correct length Or arc of 6cm or 8cm	
		52	2250 to 60500 nfww	3FT	M2 for $\frac{1}{2} \times 550 \times$	
					(<i>their</i> correct height \times	50)
					Or $\frac{1}{2} \times 11 \times their$ corr	
					or B1 for <i>their</i> correct hei or <i>their</i> correct height	-
					If 0 scored then SC1 fo	or $\frac{1}{2} \times 550 \times$
					$(50 \times k)$	-
4	(a) (i)	T	ranslation	1		
		[.	- 7 - 8	1	Accept 7 left and 8 dov	wn
	(ii)	[S	nlargement Scale factor] 0.5 Centre] (0, 0)	1 1 1		
	(b) (i)	D	at (-2, 4) (-4, 4) (-3, 6)	1		
	(ii)	E	at (-4, 2) (-4, 4) (-6,3)	2	B1 for correct orientation or 90° rotation clockw	

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5	5 (a) (i) 230 (ii) 252		2 2	M1 for $130 + 4 \times 25$ or better M1 for $4n = 1138 - 130$ or better Or $(1138 - 130) / 4$ or better		
	(b) (i)	9	1			
	(ii)	3.5	2	M1 for $8y = 24 + 4$ or better Or $y - 4/8 = 24/8$ or better		
	(iii)	4	3	M1 for first correct step M1FT for second correct step		
	(c)	x = 1.5 or 3/2 y = -5	4	M1 for correctly equating one set of coefficients. M1 for correct method to eliminate one variable. A1 for $x = 1.5$ A1 for $y = -5$		
6	(a)	252.56	2	M1 for $(30 + 30 + 17) \times 3.28$ or better oe		
	(b) (i)	510	2	M1 for 30 × 17		
	(ii)	170 102 136	3	M2 for 2 correct areas clearly identified or M1 for $408 \div (5 + 3 + 4)$ soi by 34 or one correct area clearly identified SC2 for three correct answers in incorrect places		
	(c)	34.5	3	M2 for $\sqrt{30^2 + 17^2}$ soi by $\sqrt{1189}$ or M1 for $30^2 + 17^2$ soi by 1189		
	(d) (i)	63.6 or 63.61 – 63.63	2	M1 for $4.5^2 \times \pi$ or 20.25 π		
	(ii)	127 or 127.2	1FT	FT for <i>their</i> (d)(i) $\times 2$		

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7	(a)		14, 4, 2, 8, 14	3	B2 for 4 correct B1 for 2 or 3 correct	
	(b)		8 points correctly plotted	P3FT	P2FT for 6 or 7 points correctly plotte P1FT for 4 or 5 points correctly plotte	ed ed
			Smooth and correct curve through all correct points	C1		
	(c)		$x = 0.5 \text{ or } x = \frac{1}{2}$	1		
	(d)	(i)	y = 9 ruled	1		
		(ii)	-2.15 to -2.25 3.15 to 3.25	1FT 1FT		
8	(a)	(i)	July or Jul	1		
		(ii)	10.9	1		
	((iii)	- 9.6	1		
	(b)	(i)	$150 \div \frac{90}{360}$ oe	1	Accept $150 \times \frac{360}{90}$, 150×4	
		(ii)	250	3	M1 for <i>their</i> 150/360 × 600 or <i>their</i> 150 × 150/90 and B1 for 150 seen as angle	
	(c)		11682	3	M2 for $885 \times 15 \times 0.88$ oe M1 for 885×0.88 oe or $885 \times 15 \times 0.12$ oe	
	(d)	(i)	4.48×10^6 cao	1		
		(ii)	9.82	3	M2 for $\frac{4920000 - 4480000}{4480000} \times 100$ of	e
					or $\left(\frac{4920000}{4480000} - 1\right) \times 100$ oe	
					or B1 for 440000 or 0.44 or 1.098() or 109.8()	

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9	(a) (i)	Chord Radius	1 1		
	(ii)	12 Tangent [meets] radius [at] 90 [°]	1 1		
	(iii)	66 Angles [in] triangle 180 or Angle [in a] semi–circle [= 90]	2 1	M1 for BCD identified as 90 or 180–24–90	
	(b) (i)	Octagon	1		
	(ii)	360 ÷ 8 [= 45]	M1	alternative method M1 for (8–2) × 180 [=108 or 6 × 180 [=1080]	0]
		(180 – <i>their</i> 45) ÷ 2	M1FT	M1FT for (<i>their</i> 1080 ÷ 8 or <i>their</i> 1080 ÷ 16) ÷ 2
		67.5	A1	A1 for 67.5	
	(c)	15	2	M1 for 360 / 24	