

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

Cambridge International General Certificate of Secondary Education

**MARK SCHEME for the October/November 2014 series**

**0580 MATHEMATICS**

**0580/32**

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.

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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
nfw	not from wrong working
soi	seen or implied

<b>Question.</b>	<b>Answers</b>	<b>Mark</b>	<b>Part Marks</b>
<b>1 (a)</b>	$4 \times 1000 \times 1000$ or $4 \times 1000^2$	<b>1</b>	
<b>(b)</b>	$0.95 \times 4\,000\,000$ oe	<b>1</b>	
<b>(c) (i)</b>	$3 \div 19 \times 3\,800\,000$	<b>2</b>	<b>M1</b> for $3 \div (11 + 5 + 3)$ or $3\,800\,000 \div (11 + 5 + 3)$
<b>(ii)</b>	2 200 000	<b>1</b>	
<b>(iii)</b>	15 710	<b>2FT</b>	<b>M1FT</b> for <i>their</i> $2\,200\,000 \div 140$
<b>(d) (i)</b>	$1 - \left( \frac{24}{40} + \frac{5}{40} \right)$	<b>M2</b>	<b>M1</b> for $\frac{24}{40}$ or $\frac{5}{40}$ or $\frac{3 \times 8}{5 \times 8}$ or $\frac{1 \times 5}{8 \times 5}$
	$\frac{11}{40}$ or $\frac{11\text{k}}{40\text{k}}$ final answer	<b>A1</b>	If zero scored, <b>SC3</b> for $1 - (0.6 + 0.125) = 0.275 = \frac{275}{1000} =$ $\left[ \frac{11}{40} \text{ or } \frac{11\text{k}}{40\text{k}} \right]$ or <b>SC2</b> for $1 - (0.6 + 0.125) = 0.275 = \frac{275}{1000}$ followed by incorrect fraction <b>SC1</b> for $\frac{11}{40}$ or $\frac{11\text{k}}{40\text{k}}$ final answer
<b>(ii)</b>	165 000	<b>1FT</b>	<b>FT</b> <i>their</i> <b>(d)(i)</b> $\times 600\,000$
<b>(e)</b>	281 216 cao	<b>3</b>	<b>M2</b> for $250\,000 \times 1.04^3$ oe or <b>M1</b> for $250\,000 \times 1.04^2$ oe If zero scored, <b>SC1</b> for 31 216

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2	(a)	Octagon	1		
	(b)	135	3	<b>M2</b> for $180 - (360 \div 8)$ or <b>M2</b> for $\frac{(8-2) \times 180}{8}$ or <b>M1</b> for $(360 \div 8)$ or <b>M1</b> for $(8-2) \times 180$	
	(c)	(i)	22 29 36	2	<b>B1</b> for two terms in correct places or 2 terms with a difference of 7.
		(ii)	$7n + 1$ oe	2	<b>B1</b> for $7n + j$ or $kn + 1$ ( $k \neq 0$ )
		(iii)	71	1FT	<b>FT</b> for <i>their</i> (c)(ii) if linear
		(iv)	13 <b>nfww</b>	2	<b>M1FT</b> for <i>their</i> (c)(ii) = 92 or <b>M1</b> for $(92 - 1) \div 7$ or $91 \div 7$ or <b>M1</b> for $7 \times 13 + 1 = 92$
3	(a)	Reflection [in] <i>AB</i>	1		
		Rotation $180^\circ$ oe	1		
		Midpoint of <i>AB</i> oe	1		
	(b)	(i)	Translation 2 left and 7 up	2	<b>SC1</b> for one of 7 up or 2 left
		(ii)	Correct Enlargement	2	<b>SC1</b> for enlargement scale factor 3 but incorrectly placed
(c)	Correct line of symmetry	1FT	<b>FT</b> is <i>their</i> (b)(ii)		
4	(a)	(i)	Line (0700, 0) to (08 40, 310) Horizontal line 2 squares Line <i>their</i> (08 50, 310) to (09 40, 470)	1 1FT 1FT	Lines need not be ruled and could be curves with positive gradients throughout.
		(ii)	2[h]40[min]	1	
		(iii)	176.25	2	<b>M1FT</b> for $470 \div$ <i>their</i> (a)(ii)
	(b)	(i)	2[h]21[min]	2	<b>M1</b> for $470 \div 200$ soi
		(ii)	Line from (07 45, 470) to ( <i>their</i> 10 06, 0)	2FT	<b>B1</b> for (07 45, 470) correctly plotted or <b>B1FT</b> for ( <i>their</i> 10 06, 0) correctly plotted
	(c)	290 to 300	1FT	(Correct or follow through) <b>FT</b> from intersection on <i>their</i> graph.	

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5	(a) (i)	Trapezium	1	
	(ii)	Pentagon	1	
	(b) (i)	$[BC =] \sqrt{52^2 - 20^2} [= 48]$	<b>B2</b>	<b>B1</b> for $52^2 = BC^2 + (70 - 50)^2$ or $52^2 = BC^2 + 20^2$ or $BC^2 = 52^2 - 20^2$
	(ii)	3936 or 3940	2	<b>M1</b> for $(70 + 12) \times 48$ oe
	(c) (i)	220	1	
	(ii)	2880	2	<b>M1</b> for $0.5(50 + 70) \times 48$ oe
	(d)	108	3	<b>B1</b> for $[AE =] 24$ <b>M1</b> for $0.5 \times \textit{their AE} \times 9$
	(e)	948	<b>1FT</b>	<b>FT</b> <i>their (b)(ii) – (their (c)(ii) + their (d))</i>
6	(a) (i)	-5 -8 5 2.5	2	<b>B1</b> for 3 correct
	(ii)	8 points correctly plotted Correct curve	<b>B3FT</b> 1	<b>B2FT</b> for 6 or 7 correct points <b>B1FT</b> for 4 or 5 correct points
	(iii)	Ruled line $y = 6$ drawn 3.1 to 3.6	1 1	Independent marks
	(b) (i)	-5 -1 3	2	<b>B1</b> for 2 correct
	(ii)	Ruled correct line	1	
	(iii)	$\frac{1}{2}$ oe	1	
	(c)	7.2 to 7.6 -5.2 to -5.6	<b>1FT</b> <b>1FT</b>	
7	(a) (i)	15.5	2	<b>M1</b> Sum of the 10 items of data $\div 10$
	(ii)	16	2	<b>M1</b> for ordering at least first or last 6 items or for 14 <b>and</b> 18 indicated
	(iii)	26	1	
	(b) (i)	6 correct bars	2	<b>B1</b> for 4 or 5 correct bars or 6 correct heights
	(ii)	Aug[ust]	1	
	(iii)	$\frac{4}{12}$ oe	1	

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8	(a) (i)	[0]63 to [0]67	1	
	(ii)	8	2	<b>B1</b> for $6 \pm 0.2$ [cm] seen in working
	(b)	$QR$ on bearing $123^\circ$ to $127^\circ$ 9.3 cm to 9.7 cm continuous ruled line	1 2FT	<b>B1</b> for bearing of $123^\circ$ to $127^\circ$ <b>M1FT</b> for $76 \div$ <i>their</i> (a)(ii) soi by calculation or distance on diagram
	(c) (i)	297 – 270 or $90 - (360 - 297)$	1	
	(ii)	7.6 cao nfw	3	<b>M1</b> for $\cos 27^\circ = \frac{PW}{8.5}$ or $\sin 63^\circ = \frac{PW}{8.5}$ or better <b>A1</b> for 7.57(...) <b>B1ind</b> for correctly rounding <i>their</i> 7.57(...) to 2 sig figs if <i>their</i> 7.57(...) is to 3 sig figs or more
	(d)	Correct continuous perpendicular bisector of $AB$ with two pairs of correct arcs	2	<b>B1</b> for correct continuous bisector without arc or with incorrect arcs
9	(a) (i)	338.4[0]	3	<b>M2</b> for $5 \times 36 + 660 \times 0.24$ or better or <b>M1</b> for $5 \times 36$ or $660 \times 0.24$ or better
	(ii)	389.16	2FT	<b>M1FT</b> for $1.15 \times$ <i>their</i> (a)(i) oe
	(b) (i)	60	1	
	(ii)	108	1FT	$1.8 \times$ <i>their</i> (b)(i)
	(iii)	497.16	1FT	<b>FT</b> <i>their</i> (a)(ii) + <i>their</i> (b)(ii)
	(c)	31 nfw	2FT	<b>M1FT</b> for $\frac{\textit{their}(\text{b})(\text{iii})}{1600} \times 100$