

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
- nfww not from wrong working
- soi seen or implied

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

2	(a)	Octagon	1		
	(b)	135	3	M2 for $180 - (360 \div 8)$ or M2 for $\frac{(8-2) \times 180}{8}$ or M1 for $(360 \div 8)$ or M1 for $(8-2) \times 180$	
	(c)	(i)	22 29 36	2	B1 for two terms in correct places or 2 terms with a difference of 7.
		(ii)	$7n + 1$ oe	2	B1 for $7n + j$ or $kn + 1$ ($k \neq 0$)
		(iii)	71	1FT	FT for <i>their</i> (c)(ii) if linear
		(iv)	13 nfww	2	M1FT for <i>their</i> (c)(ii) = 92 or M1 for $(92 - 1) \div 7$ or $91 \div 7$ or M1 for $7 \times 13 + 1 = 92$
3	(a)	Reflection [in] <i>AB</i>	1		
		Rotation 180° oe	1		
		Midpoint of <i>AB</i> oe	1		
	(b)	(i)	Translation 2 left and 7 up	2	SC1 for one of 7 up or 2 left
		(ii)	Correct Enlargement	2	SC1 for enlargement scale factor 3 but incorrectly placed
(c)	Correct line of symmetry	1FT	FT 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	M1FT for $470 \div \textit{their} (a)(ii)$
	(b)	(i)	2[h]21[min]	2	M1 for $470 \div 200$ soi
		(ii)	Line from (07 45, 470) to (<i>their</i> 10 06, 0)	2FT	B1 for (07 45, 470) correctly plotted or B1FT for (<i>their</i> 10 06, 0) correctly plotted
	(c)	290 to 300	1FT	(Correct or follow through) FT from intersection on <i>their</i> graph.	

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

8	(a) (i)	[0]63 to [0]67	1	
	(ii)	8	2	B1 for 6 ± 0.2 [cm] seen in working
	(b)	<i>QR</i> on bearing 123° to 127° 9.3 cm to 9.7 cm continuous ruled line	1 2FT	B1 for bearing of 123° to 127° M1FT 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	M1 for $\cos 27^\circ = \frac{PW}{8.5}$ or $\sin 63^\circ = \frac{PW}{8.5}$ or better A1 for 7.57(...) B1ind 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 <i>AB</i> with two pairs of correct arcs	2	B1 for correct continuous bisector without arc or with incorrect arcs
9	(a) (i)	338.4[0]	3	M2 for $5 \times 36 + 660 \times 0.24$ or better or M1 for 5×36 or 660×0.24 or better
	(ii)	389.16	2FT	M1FT 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	FT <i>their</i> (a)(ii) + <i>their</i> (b)(ii)
	(c)	31 nfw	2FT	M1FT for $\frac{\textit{their}(\text{b})(\text{iii})}{1600} \times 100$