MARK SCHEME for the October/November 2012 series

0444 MATHEMATICS (US)

0444/33   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.

Cambridge is publishing the mark schemes for the October/November 2012 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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	**(a)**	2 hours 45 minutes oe	1	
	(b)	26 000	1	
	(c)	20	2	**M1** $5 \div 0.25$ or $5000 \div 250$
	(d) (i)	30 and 60	1	
	(ii)	72	1	
	(iii)	60	1	
	(e) (i)	fully correct bar chart	3	**B1** correctly scaled frequency axis **B2** correct height of bars or **B1** correct height of 5 or 6 bars or all bars correct height but unequal widths or gaps
	(ii)	1	1	
2	**(a)** (i)	(0)355	2	**B1** 0025 or 2030 seen **SC1** 2055 as answer
	(ii)	26° or -26°	1	
	(b)	135.43 cao	2	**M1** $7854 \div 56$ implied by 135 (428…)
3	**(a)** (i)	8, 12, 20	2	**B1** for any two correct May be indicated on mapping diagram **B1** for $5x$
	(ii)	1, 2, 4, 8	1	
	(b) (i)	$5x + 25$	2	**B1** for +25
	(ii)	[25], 30, 35, 40, 45, 50	2	**B1** for at least 3 correct, -1 for each extra or **SC1** for $25 \leqslant T(x) \leqslant 50$
4	**(a)**	240000	1	
	(b)	1200, 450, 750	3	**SC1** $2400 \div 16$ implied by 150 and **B1** 2 correct amounts
	(c)	224973	3	**M2** 224972.8 or 200000×1.04^3 **M1** 200000×1.04^2 or 216320

(d)	**(i)** 2250 900 36	1, 1, 1	**SC1** if their numbers add to 3150	
(d)	**(ii)** 2 correct sectors ± 2° correct labels	1 1		
5 (a)	**(i)** 2.5 or 5/2 or $2\frac{1}{2}$	2	**M1** $6x - 2x = 8 + 2$ or better	
	(ii) 4.5 or 9/2 or $4\frac{1}{2}$	3	**M1** $8y - 12$ or $2y - 3 = 6$ **M1** $8y = 36$ ft *their* first step	
(b)	$(x=)$ 3, $(y =)$ −4	4	**M1** coefficient of x or y the same **M1** for addition or subtraction **A1** for 1 correct answer **A1** for second correct answer ww both correct **B4** ww one correct **B0**	
6 (a)	Parallelogram	1		
(b)	Rotation, 90° clockwise, about origin	3	**B1** Each part	
(c)	**(i)** Correct reflection	2	**B1** reflection in the x axis	
	(ii) Correct translation	2	**B1** 6 left or 4 down	
	(iii) Correct enlargement	2	**B1** Correct size, wrong position	
7 (a)	**(i)** 3 − 1	2	**B1** 1 mark each If **B0** award **B1** if term 2 − term 1 = − 1	
	(ii) subtract 4	1		
	(iii) − 4n + 23 oe final answer	2	**M1** −4n+ k as answer	
(b)	8, 10, 12	2	**M1** 2 correct terms	
(c)	27, 3n+ 3 oe final answer	3	**B1** 27 **B1** 3n = k or jn + 3 ($j \neq 0$)	
8 (a)	63 (Angles on a straight) line (add to) 180	1 1		
(b)	90 (Angle in a) semi circle	1 1		
(c)	117 Corresponding (angles)	1 1		
(d)	90 Tangent and radius	1 1		

9	(a)	5.4(0)		2	**M1** $\tan 42 = \dfrac{DF}{6}$ or better
	(b)	32.4		2ft	$\dfrac{12 \times 5.4}{2}$ ft *their* 5.4
	(c)	5.66		3	**M2** $\sqrt{6-2}$ **M1** $6^2 - 2^2 + AH$ or better
	(d)	64		2	**M1** $12 + 18 + 14 + 3 + 2 + 15$
	(e)	33.3 cao		4	**M1** $(12 \times 18) + (2 \times 3)$ oe **B1** 222 **M1** 222 ft $\times$ 0.15
10	(a)	$-1, -5, -1, 4$		3	**M2** 3 correct **M1** 1 correct
	(b)	Correct graph		4	**B3** All points correctly plotted ft **B2** 6 or 7 points plotted ft **B1** 4 or 5 points plotted ft **B1** Smooth curve
	(c)	(i)	$x = -1$ drawn	1	
		(ii)	$x = -1$ cao	1	
	(d)	1.8 – 1.9 and $-3.8 – 3.9$		2 ft	**B1** 1.8 – 1.9 or $^-3.8 – ^-3.9$
11	(a)	(i)	14.8 − 15.2	2	**M1** 7.4 − 7.6
		(ii)	*D* correctly marked 133 – 37° and 4.3 −4.7 cm from A	2	**B1** for correct bearing or distance.
	(b)	(i)	$3.24 (1) \times 10^5$	1	
		(ii)	*C* by 2.477×10^5 cao	3	**SC2** for *C* by figs 2477 or figs 248 **M1** 324100 – 76400 or *their* (b) − 7.64×10^4