

## **MARK SCHEME for the October/November 2012 series**

### **0580 MATHEMATICS**

**0580/33**

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.

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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.	Part	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)	fully correct bar chart		3	B1 correctly scaled frequency axis B2 correct height of bars, width and spaces or B1 correct height of 5 or 6 bars or all bars correct height but unequal widths or gaps
		(ii)	1		1	
	(iii)	1.97 (1.9655....)	3	M1 attempt to multiply implied by 0, 11, 12, 9, 8, 5, 12 added implied by 57 M1 dep ft $57 \div \text{their } 29$ or B2 1.96 or 2.103		
2	(a)	(i)	stopped	1		
		(ii)	5 hours 30 mins or $5 \frac{1}{2}$ hours	1		
		(iii)	32.72 – 32.73 or 32.7	2 ft		M1 $180 \div \text{their (a)(ii) ft}$ correct to 3 sig figs
		(iv)	10(00) and 12(00)	1		
		(v)	Line or curve from 1100,0 to 1530,180	1		
	(b)	(i)	(0)355 or 3.55 am	2		B1 0025 or 2030 seen SC1 2055 as answer or 3.55 pm as answer
		(ii)	$26^\circ$ or $-26^\circ$	1		
(c)	135.43 cao	2	M1 135 or 135.4 or $7854 \div 56$ , implied by 135.(428...)			

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3	(a)	240000	1	
	(b)	1200, 450, 750	3	SC2 for all three correct in wrong order seen SC1 for $2400 \div 16$ implied by 150
	(c)	224973	3	M2 224972.8 or $200000 \times 1.04^3$ or 224793.0(0) if M0 M1 $200000 \times 1.04^2$ or 216320 SC1 for their answer correctly rounded to nearest dollar
	(d)	(i) 2250  900                  36  (ii) 2 correct sectors correct labels	1,1,1   1 1	If first B0,B0 then SC1 for adding to 3150   Must only be 4 sectors in total
4	(a)	(i) 2.5 or $5/2$ or $2\frac{1}{2}$  (ii) 4.5 or $9/2$ or $4\frac{1}{2}$	2  3	M1 $6x - 2x = 8 + 2$ or better  M1 $8y - 12$ or $2y - 3 = 6$ M1 $8y = 36$ ft or $2y = 9$ ft <i>their</i> first step
	(b)	(x =) 3, (y =) -4	4	M1 coefficient of x or y the same dep M1 for addition or subtraction A1 for 1 correct answer (their first answer)
5	(a)	Parallelogram	1	
	(b)	Rotation, $90^\circ$ clockwise, about origin	1,1,1	
	(c)	(i) Correct reflection	2	B1 reflection in the x axis
		(ii) Correct translation	2	B1 for translation $-6, k$ or $k, -4$
	(iii) Correct enlargement	2	B1 Correct size, wrong position	
6	(a)	(i) $3 - 1$  (ii) subtract 4  (iii) $-4n + 23$ oe final answer	1,1  1 2	If B0 award B1 if term 2 – term 1 = - 4  Accept minus 4, take away 4  M1 $-4n + k$ or $jn + 23$ ( $j \neq 0$ ) as answer
	(b)	8, 10, 12	2	M1 2 correct terms SC1 for 6, 8, 10
	(c)	27, $3n + 3$ oe final answer	3	B1 27 B1 $3n + k$ or $jn + 3$ ( $j \neq 0$ )

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7	(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	
8	(a)	5.4(0)	2	<b>M1</b> $\tan 42 = DF/6$ or better
	(b)	32.4	2ft	<b>M1</b> $\frac{12 \times \text{their } 5.4}{2}$ ft
	(c)	5.66	3	<b>M2</b> $\sqrt{6^2 - 2^2}$ or better (accept $\sqrt{32}$ or 5.65) <b>or M1</b> $6^2 - 2^2$ or better (accept 32)
	(d)	64	2	<b>M1</b> $12 + 18 + 14 + 3 + 2 + 15$
	(e)	33.3 cao	4	<b>M1</b> $(12 \times 18) + (\text{their } (2) \times 3)$ oe <b>and A1</b> 222 <b>and M1</b> <i>their</i> 222 ft $\times 0.15$
9	(a)	-1, -5, -1, 4	3	<b>B2</b> 3 correct <b>B1</b> 2 correct
	(b)	8 correct points plotted  Smooth curve through 8 correct points and correct shape	3ft  1	<b>B2ft</b> 6 or 7 points plotted ft <b>B1ft</b> 4 or 5 points plotted ft
	(c)	(i) $x = -1$ drawn (ii) $x = -1$ oe cao	1 1	
	(d)	1.8 to 1.9 and -3.8 to -3.9	2 ft	<b>B1 B1</b>

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<b>10</b>	<b>(a)</b>	<b>(i)</b> 14.8 to 15.2	<b>2</b>	<b>M1</b> 7.4 to 7.6
		<b>(ii)</b> <i>D</i> correctly marked 133 – 137° and 4.3 – 4.7 cm from <i>A</i>	<b>2</b>	<b>B1</b> for correct bearing or distance.
		<b>(iii)</b> 260 to 264°	<b>1</b>	
	<b>(b)</b>	<b>(i)</b> $3.24 (1) \times 10^5$	<b>1</b>	
		<b>(ii)</b> <i>C</i> by $2.477 \times 10^5$ or $2.48 \times 10^5$	<b>3</b>	<b>SC2</b> for <i>C</i> by figs 2477 or figs 248 <b>M1</b> 324100 – 76400 or <i>their (b)</i> – $7.64 \times 10^4$ evaluated