## MARK SCHEME for the May/June 2011 question paper

## for the guidance of teachers

## 0581 MATHEMATICS

0581/32

Paper 3 (Core), maximum raw mark 104

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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.	Answers	Mark	Part Marks
1	(a) (i)	3000 ÷ (4+7+8+5) and multiply by 7	2	<b>M2</b> for $\frac{7}{24} \times 3000$
				<b>M1</b> for 3000 ÷ (24 or their clear attempt at total)
	(ii)	500 www cao	2	M1 for 4 ÷ their 24 × 3000 oe or $\frac{4}{7}$ × 875
	(b)	$\frac{1}{3}$	2	<b>B1</b> for $\frac{8}{24}$ or $\frac{4}{12}$ or $\frac{2}{6}$ oe seen or <b>SC1</b> $\frac{2}{5}$
	(c)	560	2	<b>M1</b> for $64 \div 100 \times 875$ or $0.64 \times 875$ oe
	(d)	23.5 or 23.52 to 23.53	3	<b>W1</b> for 105 – 85 implied by 20
				<b>M1</b> dep for their $(105 - 85) \div 85 \times 100$
	(e)	5660	3	<b>B2</b> for 5660.48 or 5660.5 or 660
				If <b>B0</b> then <b>M1</b> for $5000 \times (1 + \frac{6.4}{100}) \times (1 + \frac{6.4}{100})$ or better
2	(a) (i)	Enlargement (Scale factor) $-\frac{1}{2}$ (centre) origin oe	1 1 1	Independent marks
	(ii)	12	2	<b>M1</b> for 0.5 × 6 × 4 or <b>SC1</b> for –12
	(iii)	15.7 to 16.5(cm)	1	
	(b)	Image (0, -2), (-6, -2) and (-4, -6)	1	
	(c)	Image (2, 0), (2, 6) and (6, 4)	2	<b>SC1</b> rotation 90° anti-clockwise or 90° clockwise about any other point
	(d)	Reflection	1	Independent marks
		y = -x oe	1	if no equation given then accept correct line drawn on diagram

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3	(a)	Scale shown on axis in 2s or Bars correct for their linear s		<ul> <li>B1 for 3 bars correct or</li> <li>B1 for 4 correct tops only shown,</li> <li>B0 for line graph</li> <li>allow consistent gaps between bars</li> </ul>		
	(b)	Silver	1			
4	(a) (i)	(\$)57.5(0)	2	<b>M1</b> for 12 + 6.5 × 7		
	(ii)	12 + 6.5(0) n oe	1			
	(iii)	5	2ft	<b>M1</b> for (44.5(0) – their 12) ÷ th	eir 6.5 soi	
	(b)	(x =) 5, (y =) -7	3	ww both correct <b>B3</b> ww one correct <b>B0</b> <b>M1</b> for consistent multiplication and add/subtract or by substitution <b>M1</b> for 5x + 3(3x - 22) = 4 oe <b>A1</b> for 1 correct answer		
5	(a)	Triangle, Pentagon, Octagor	n <b>1,1,1</b>	In correct position in the table		
	(b) (i)	( <i>x</i> =) 40	2	<b>M1</b> for $360 \div 9$ or complete lon	g method	
	(ii)	140	1ft	ft 180 – <b>(b)(i)</b>		
6	(a) (i)	1700	1	1		
	(ii)	(ii) 1858(.3) or 1860		M1 for attempt at sum divided b or SC1 for 20558.3	oy 12	
	(iii) 1750		2	M1 for clear attempt to find the	middle	
	(b) (i)	(Strawberry) 120 (Vanilla) 100	3	<b>B2</b> if only one is correct <b>B1</b> for Strawberry + Vanilla = 220 and/or <b>M1</b> for (Strawberry) $3600 \div (4200 + 3600 + 3000) \times 360$ or $140 \div 4200 \times 3600$ or better or (Vanilla) $3000 \div (4200 + 3600 + 3000) \times 360$ or $140 \div 4200 \times 3000$ or better		
	(ii)	Angles correct Labelling with names	1ft 1ft	Independent. Consistent with angles in their table.		
	(c) (i)	5 points correctly plotted	2	<b>B1</b> for 3 or 4 correct		
	(ii)	Positive	1			
	(iii)	Hotter weather more sales	1	Or any equivalent statement		

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7 (a) (i)	-1, -3, 3	2	<b>B1</b> for any 2 correct		
(ii)	8 points correctly plotted	3ft	<b>B2</b> for 6 or 7 correctly plotted <b>B1</b> for 4 or 5 correctly plotted		
	Smooth curve	1	Must be close to parabolic in shape		
(iii)	(x =) -2.4 to $-2.2$ cao and 1.2 to 1.4 cao	1 1			
(b) (i)	$x = -\frac{1}{2}$ drawn	1	Accept dotted/dashed as intention clear		
(ii)	$x = -\frac{1}{2}$ oe cao	1			
(c) (i)	Ruled line through <i>A</i> and <i>B</i>	1			
(ii)	(-2, -1) and $(3, 9)$ cao	1,1			
(iii)	2	2	<b>M1</b> for numbers representing "Change in <i>y</i> / Change in <i>x</i> ", implied by $\frac{2k}{k}$		
(iv)	(y =) 2x + 3 oe	2ft	<b>B1</b> $y = \text{their (c)(iii)} x + k \text{ or } y = mx + 3 \ (k, m \neq 0)$		
8	All ft in this question are strict follow through				
(a) (i)	(0)55°	1			
(ii)	6 (km/h)	1			
(b)	Line on bearing 145°	1	Independen	t marks	
	(BC =) 7  cm	1			
(c) (i)	strict follow through	1ft	Follow through their CA		
(ii)	strict follow through	1ft	Follow through their (c)(i) $\times 0.5$		
(iii)	strict follow through	1ft	Follow through their angle		
(d) (i)	Circle (or long enough arc) centre A, radius 4 cm Circle (or long enough arc) centre B, radius 3 cm	2	W1 for 1 correct circle (or long enough arc)		
(ii)	<b>strict follow through</b> Must be one buoy on each side of <i>AB</i> .	1ft	Dependent on clear points for the buoys, even in not labelled $P$ and $Q$ .		the buoys, even if
(iii)	strict follow through	1ft	Their (d)(ii) ÷2		

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9 (a) (i)	4968	Allow 4970	2	M1 for $4 \times 60 \times 18 + 2 \times 18 \times 18$ oe M1 for $18 \times 18 \times 60$ M1 for $\pi \times 9 \times 9 \times 60$ or $4860\pi$ If M0, SC1 for answer of 61000 to 61100		
(ii)	19440	Allow 19400	2			
(b) (i)	15260	to 15271 or 15300	2			
(ii)		r 4170 9 to 4180 or 4140 9 to 4140 or 4100	1ft	ft their(a)(ii) – their(b)(i) provided (a)(ii) > (b)(i)		
(iii)	3391 to	o 3393.5 or 3390	2	<b>M1</b> for $2 \times \pi \times 9 \times 60$ or $1080\pi$ If <b>M0</b> , <b>SC1</b> for answer of 6780 to 6790		
10 (a) (i)	43 36		1			
(ii)	-1 3		1, 1ft	ft ft 4 more than $5^{\text{th}}$ term		
(b)	-27		1			
(c)	4 <i>n</i> – 2	1 oe	2	<b>B1</b> for $4n + k$ or $jn - 21$ where $j$ and $k$ are positive or negative integers and $j \neq 0$ .		
(d) (i)	( <i>n</i> =) 9		2 <b>ca</b> 0	M1 for $78 - 7n$ = their (c) if linear. M1 for $78 - 7 \times$ their (d)(i) or substituting their (d)(i) into their (c)		
(ii)	15		2 <b>ca</b> 0			