UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2011 question paper

for the guidance of teachers

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 must be read in conjunction with the question papers and the report on the examination.

- Cambridge will not enter into discussions or correspondence in connection with these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2011 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

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	**M2** for $\frac{7}{24} \times 3000$ **M1** for 3000 ÷ (24 or their clear attempt at total)
(ii)	500 www cao	2	**M1** for 4 ÷ their 24 × 3000 oe or $\frac{4}{7} \times 875$
(b)	$\frac{1}{3}$	2	**B1** for $\frac{8}{24}$ or $\frac{4}{12}$ or $\frac{2}{6}$ oe seen or **SC1** $\frac{2}{5}$
(c)	560	2	**M1** for 64 ÷ 100 × 875 or 0.64 × 875 oe
(d)	23.5 or 23.52 to 23.53	3	**W1** for 105 – 85 implied by 20 **M1**dep for their (105 – 85) ÷ 85 × 100
(e)	5660	3	**B2** for 5660.48 or 5660.5 or 660 If **B0** then **M1** 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	**M1** for 0.5 × 6 × 4 or **SC1** 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	**SC1** rotation 90° anti-clockwise or 90° clockwise about any other point
(d)	Reflection $y = -x$ oe	1 1	Independent marks if no equation given then accept correct line drawn on diagram

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

7 (a) (i)	–1, –3, 3	**2**	**B1** for any 2 correct
(ii)	8 points correctly plotted	**3ft**	**B2** for 6 or 7 correctly plotted **B1** 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 A and B	**1**	
(ii)	(–2, –1) and (3, 9) cao	**1,1**	
(iii)	2	**2**	**M1** for numbers representing "Change in y/ Change in x", implied by $\frac{2k}{k}$
(iv)	(y =) $2x + 3$ oe	**2ft**	**B1** y = their **(c)(iii)** $x + k$ 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**	Independent 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)** × 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)	**strict follow through** Must be one buoy on each side of AB.	**1ft**	Dependent on clear points for the buoys, even if not labelled P and Q.
(iii)	**strict follow through**	**1ft**	Their **(d)(ii)** ÷2

9 (a) (i)	4968 Allow 4970	**2**	**M1** for $4 \times 60 \times 18 + 2 \times 18 \times 18$ oe
(ii)	19440 Allow 19400	**2**	**M1** for $18 \times 18 \times 60$
(b) (i)	15260 to 15271 or 15300	**2**	**M1** for $\pi \times 9 \times 9 \times 60$ or 4860π If **M0**, **SC1** for answer of 61000 to 61100
(ii)	4172 or 4170 or 4169 to 4180 or 4140 or 4129 to 4140 or 4100	**1ft**	ft their**(a)(ii)** – their**(b)(i)** provided **(a)(ii)** > **(b)(i)**
(iii)	3391 to 3393.5 or 3390	**2**	**M1** for $2 \times \pi \times 9 \times 60$ or 1080π If **M0**, **SC1** for answer of 6780 to 6790
10 (a) (i)	43 36	**1**	
(ii)	–1 3	**1, 1ft**	ft 4 more than 5th term
(b)	–27	**1**	
(c)	$4n - 21$ oe	**2**	**B1** for $4n + k$ or $jn - 21$ where j and k are positive or negative integers and $j \neq 0$.
(d) (i)	$(n =)$ 9	**2cao**	**M1** for $78 - 7n =$ their **(c)** if linear.
(ii)	15	**2cao**	**M1** for $78 - 7 \times$ their **(d)(i)** or substituting their **(d)(i)** into their **(c)**