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

0580/31 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.

UNIVERSITY of CAMBRIDGE
International Examinations

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 Mark
1 (a)	342.63	**2**	**M1** for 500 ÷ 1.4593
(b)	280	**3**	**M1** for 2 × 62 + 3 × 52 **B1** for 124 or 156 seen
(c)	71.4 or 71.42 to 71.43	**1ft**	
(d)	4.12	**2**	**B1** for 6 × 0.98 seen **B1** for 5.88 or 4 + 6 × 0.02
(e)	correct working	**1**	50 × 2.54 = 127 oe or 130 ÷ 2.54 = 51.2 or better
2 (a)	(triangular) prism	**1**	
(b)	49.6 to 50.4	**1**	
(c) (i)	6	**2**	**M1** for ½ × 4 × 3 oe
(ii)	42	**2ft**	**M1** for their **(c)(i)** × 7
(d)	3.5	**2ft**	**M1** for their **(c)(ii)** ÷ (3 × 4) oe
3 (a) (i)	10	**2**	**M1** 3 × 2 – –4 or better
(ii)	8	**3**	**M1** for 19 = 3m – 5 oe **M1** for m = (19 + 5) ÷ 3 oe
(b)	$7fg - g^3$	**2**	**B1** for $7fg$ or **B1** for $-g^3$
(c)	$6h(3h - 2j)$	**2**	**B1** for partial factorisation $2(9h^2 - 6hj)$ or $3(6h^2 - 4hj)$ or $h(18h - 12j)$ or $6(3h^2 - 2hj)$ or $3h(6h - 4j)$ or $2h(9h - 6j)$ or **B1** for $6h(ah - 2j)$ or $6h(3h - bj)$
(d)	$\frac{t-15}{8}$	**2**	**M1** for correct first step or **M1** for correct second step ft
(e)	9	**3**	**M1** for $3p - 15$ **M1** for collecting their terms $2p = k$ or $kp = 18$

© University of Cambridge International Examinations 2011

4 (a) (i)	1	**1**	
(ii)	15	**1**	
(iii)	10	**1**	
(b) (i)	3	**1**	
(ii)	24	**2**	**M1** for $4 \div 10 \times 60$ or **M1** for $4 \div \frac{1}{6}$, 4×6, $(4 \times 60)/10$ oe
(iii)	6.67 or 6.66(6...)	**3**	**M1** for dist = 5 and time = 45 seen **M1** for $5 \div 45 \times 60$ oe
(c)	horizontal line to (105, 5) line from (their 105, 5) to (10 + their 105, 0)	**1** **1ft**	
5 (a) (i)	2	**2**	**M1** for numbers representing change in y / change in x Implied by $2k/k$
(ii)	$2x + 1$	**2ft**	**M1** for {their **(a)(i)**}x + j or $kx + 1$ (j,k not equal to 0)
(b) (i)	2 –2 2	**2**	**B1** for 2 correct
(ii)	7 points correct	**3 ft**	**B2** for 5 or 6 points correct **B1** for 3 or 4 points correct
	smooth curve	**1**	Must be close to parabolic in shape
(iii)	–1.5 to –1.3 cao 1.3 to 1.5 cao	**1** **1**	
(c)	(–1, –1) and (3, 7) cao	**1, 1**	

© University of Cambridge International Examinations 2011

6 (a) (i)	144	**1**	
(ii)	125	**1**	
(iii)	103	**1**	
(iv)	159	**1**	
(b)	$2^3 \times 11$ or $2 \times 2 \times 2 \times 11$	**2**	**SC1** for 2 and 11 seen, no extras or **SC1** for $2 \times 4 \times 11$
(c)	24	**2**	**SC1** for at least one of 2, 3, 4, 6, 8 or 12 or **SC1** for $72 = 3 \times 24$ and $96 = 4 \times 24$
(d)	60	**2**	**SC1** for $60k$ or **SC1** $2\times2\times3\times5$ oe
7 (a) (i)	correct reflection	**1**	
(ii)	correct rotation	**2**	**SC1** for rotation 90° anti-clockwise or 90° clockwise about any other point
(b) (i)	enlargement sf 2 about origin	**1** **1** **1**	independent marks
(ii)	translation by $\begin{pmatrix}3\\5\end{pmatrix}$	**1** **1**	independent marks
8 (a)	frequencies 5, 3, 3, 0, 2	**3**	**B2** for 4 correct, **B1** for 3 correct If frequencies blank then **SC2** for all tallies correct, **SC1** for 3
(b) (i)	9	**1**	
(ii)	3	**1ft**	
(iii)	5	**2**	**M1** clear attempt to find middle
(iv)	4.8	**3**	**M1** for Σ their $f \times x$ implied by 144 – clear attempt **M1** dep for dividing by 30 isw
(c) (i)	$\frac{3}{30}$ oe	**1**	
(ii)	0	**1**	allow 0/30 only, accept zero, none, impossible
(iii)	$\frac{17}{30}$ oe	**1**	accept 0.566 to 0.567 isw

© University of Cambridge International Examinations 2011

9 (a)	correct triangle with arcs	**2**	**B1** without arcs or **SC1** correct mirror image with arcs
(b)	68° to 71°	**1ft**	
(c) (i)	perpendicular bisector with 2 pairs of arcs	**2**	**SC1** if accurate without arcs or accurate arcs with no line or accurate with arcs of AB or AC
(ii)	3 to 3.4 cm	**1ft**	for their P on their bisector
(d)	arc centre their A radius 5 cm	**1ft**	minimum must cut their AB and AC
(e)	shading inside arc **and** to left of perpendicular bisector	**2**	**SC1** for either condition met
10 (a) (i)	95.8 or 95.83 to 95.84	**2**	**M1** for $120 \times \sin 53$ or $\sin 53 = \frac{x}{120}$ oe
(ii)	233°	**1cao**	
(b) (i)	20.6° or 20.55 to 20.56	**2**	**M1** for $\tan = \frac{9}{24}$ oe
(ii)	17.9	**3**	**M2** for $\sqrt{20^2 - 9^2}$ or **M1** for $x^2 + 9^2 = 20^2$ oe

© University of Cambridge International Examinations 2011