UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2006 question paper

0580, 0581 MATHEMATICS

0580/03, 0581/03 Paper 3 (Core), maximum raw mark 104

This mark scheme is published as an aid to teachers and students, 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.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

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

The grade thresholds for various grades are published in the report on the examination for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses.

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Qu.	Answer	Marks	Comments	Total
1 (a) (i)	$\sqrt{35}$	1		
(ii)	3	1		
(iii)	45	1		
(iv)	2 or 3 or 37	1	accept any combination	
(v)	2	1		
(vi)	24	1		
(b) (i)	Correct arrangement of triangles drawn.	1	accept if only 1 internal line missing	
(ii)	16 25 36	2	1 mark for 2 correct	
(iii)	10000 or 1 x 10^4	1	Not 100^2	
(iv)	n^2 or $n \times n$	1	accept t = n^2 etc. do not accept x^2	
(v)	Square (numbers)	1	accept squares, squared	
				12
2 (a)	–4 –4 –10	3	1 for each correct entry	
(b)	8 correctly plotted points, within $\frac{1}{2}$ square. Smooth curve through 8 points	P3ft C1	P2 for 6 or 7 correct. ft P1 for 4 or 5 correct. ft Allow small errors in the points provided shape is maintained.	
(c)	x = 0.5 drawn.	1	must be from (0.5, –9) to curve at least	
(d)	2.2 to 2.4	1ft		
(e)	y = 1 drawn.	1	must touch curve as min. length	
(f)	(x =) –0.7 to –0.5 (x =) 1.5 to 1.7	1 1		
				12
3 (a) (i)	128.571…… or 128° 34′ (….)	2	M1 for 180 – 360/7 oe	
(ii)	128.6	1 ft	Follow through their **(a)(i)**.	
(b) (i)	$x + 3y + 80 + 95 = 360$ (or better)	1		
(ii)	$x + 3y = 185$ oe	1	Both marks may be gained in **(b)(i)**	
(iii)	40	2 ft	M1 for x correctly substituted into the linear equation. Follow through their **(b)(ii)** provided linear in x and y.	
(c) (i)	180° or angle sum of triangle mentioned	1		
(ii)	Angle in a semi-circle mentioned.	1		
(iii)	(a =) 70 (b =) 20	1 1	SC1 for a = 20 b = 70	
(iv)	40	1ft	2 × their value for b provided 0 < b < 55.	
				12
4 (a) (i)	Enlargement (Scale Factor) 3 (Centre) (2, 4)	B1 B1 B1	.	
(ii)	Reflection (in the line) x = 4	B1 B1		
(b) (i)	Correct translation drawn	2	SC1 for translation by the vector. $\begin{pmatrix}-3\\2\end{pmatrix}\begin{pmatrix}1\\-1.5\end{pmatrix}\begin{pmatrix}2\\k\end{pmatrix}\begin{pmatrix}k\\-3\end{pmatrix}$	
(ii)	Correct rotation drawn	2	SC1 for any 180° rotation. SC1 for 90° or 270° rotation about (–1, –2)	
				9

5 (a)	90	2	M1 for $0.5 \times 18 \times 10$	
(b)	14.3 art	2	M1 for $10 \times \tan 55$oe	
(c)	18.5 to 18.6	3	M1 for $0.5 \times 10 \times$ their **(b)** or M1 18 – their **(b)** M1 $\frac{1}{2}$ x 10 x their BX M1 for Their **(a)** – $(0.5 \times 10 \times$ their **(b)**$)$	
(d)	20.6 art	2	M1 for $\sqrt{(18^2 + 10^2)}$ oe	
				9
6 (a)	750cao	3	M1 Figs 10 ÷ figs 20 and figs 15 ÷ figs 10. OR M1 Figs 10 x Figs 15 and Figs 20 x Figs 10 M1 dep bricks in length × bricks in height. M1 dep. area of wall ÷ area of brick. If MO then SC1 for Figs 75	
(b) (i)	756	2	M1 for 720×1.05 oe	
(ii)	8	1ft	Their **(b)(i)** rounded up to the number of hundreds	
(c) (i)	10 4	1 1		
(ii)	2	1ft	Their cement buckets ÷ 3.5 and rounded up to next whole number	
				9
7 (a)	–1	2	SC1 for 1 SC1 for $-\frac{k}{K}$	
(b)	(m =) 2 (c =) 3	1 1		
(c) (i)	Correct line drawn.	1	must cross both axes and line A	
(ii)	$y = 2x - 3$ oe	2ft	SC1 for $m = 2$ or $c = -3$. Follow through their line for 2 and SC1.	
				7
8 (a) (i)	3 6 8 7 6 1 1 2	3	2 for 6 or 7 correct –1 if tally marks 1 for 4 or 5 correct	
(ii)	5.71 art	3	M1 for evidence of size x frequency calculated for the sizes. M1dep for sum of at least 5 ÷ 34	
(iii)	7 cao	1		
(iv)	5 cao	1		
(v)	5.5	2	M1 for evidence of finding the middle shoe size. (Not just an answer of 5 or 6)	
(vi)	17.6 art	2ft	M1 for their 6 ÷ 34 × 100 or 17.65	
(vii)	54 or 53	2ft	M1 for their 6 ÷ 34 × 306 or '53.8….'. or 53.9	
(b) (i)	12 25 19 2	2	1 mark for 2 or 3 correct or all correct but not added	
(ii)	5 and 6	1ft	Their class with the highest frequency. –1 for tally marks	
				17

9 (a)	Correct accurate drawing. (lengths ± 0.2 cm, angles ± 1°)	3	M1 for angle = 90° = BAC. M1 for AB = 7.5cm and AC = 5.5 cm. A1 for completed triangle. (Dependent on at least one M)	
(b) (i)	233° to 235°	2ft	From their diagram. M1 for their angle BCA measured correctly (± 1°)	
(ii)	182 to 190	2ft	Their BC × 20. M1 for their BC (correct is 9.1 cm to 9.5 cm)	
(iii)	2 (hours) 42 (mins)	4	SC3 for 2.7(0….) M1 for 20 × 1.85 M1 for 100 ÷ their 37 SC2 for 2 hr 7 mins with no method. B1 for their time correctly changed to hours and minutes.	
(iv)	24	2	M1 for 18 ÷ 0.75 oe	
(v)	Correct circle drawn	2	M1 for partial circle (crossing AB and AC)	
(vi)	84 to 100	2ft	M1 for 4.2 to 5.0 Follow through their diagram, dependent on intersections seen on BC	
				17

Total marks 104