UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2008 question paper

0580 and 0581 MATHEMATICS

0580/03 and 0581/03 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.

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.

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1	**(a)**	0.68 x 450 = 306 2 x 450 + 306 (= 1206)	M1 A1 M1	 dep allow 900 or 450 + 450 SCM3 for 2.68 x 450 (= 1206)
	(b)	2814	B3	M1 for 1206 ÷ 6 (implied by 201) or 450 ÷ 6 or 306 ÷ 6 M1 dep for x (6 + 5 + 3) implied by 14 SCM2 for 1206 + 1005 + 603
	(c)	4955	B2	M1 for 500 x 9.91 implied by figs 4955
	(d)	2320 or 11 20 pm	B2	SC1 for 1720 or 1120 seen SC1 for any arrival time + 6 soi [10]
2	**(a)**	translation col.vector 2 -4	B1 B1 B1	SC1 for col.vectors 4 -8 or -4 2 or for (2, -4)
	(b)	reflection (in) $x = 0$ or y axis	B1 B1	
	(c)	rotation 90º (anticlockwise) oe (about) origin oe	B1 B1 B1	 i.e. 1/4, 270 clockwise, - 270 accept (0,0), O
	(d)	enlargement (scale factor) -2 (centre) origin oe	B1 B1 B1	 SC1 for enlargement, SF=2, about origin (oe) and rotation of 180 about the origin (oe) [11]
3	**(a)** **(i)**	6,17,8,9,11,9	B2	B1 for 4 or 5 correct or for all tallies correct
	(ii)	correct bar chart	B1ft	ft from their frequency table or tallies
	(iii)	2	B1ft	from their table or chart
	(iv)	3	B1ft	from their table or chart
	(v)	3.48	B3cao	M1 for clear indication of 1x6 + 2x17 + 3x8 + 4x9 + 5x11 + 6x9 ft imp by 209 M1 dep for ÷ 60
	(b)	66º	B2ft	M1 for "11" ÷ 60 x 360 or "11" x 6 [10]

4 **(a)** **(i)**	$3x = 14 + 4$ oe $(x =)$ 6	M1 A1cao	 SC2 for 6 www
(ii)	$y + 1 = 2$ x 5 oe $(y =)$ 9	M1 A1cao	 SC2 for 9 www
(iii)	$6z - 21 - 2z + 6$ (= -9) $4z = 6$ $z = 1.5$	B1 B1ft B1cao	 ft their expansion but must be 4 terms
(b) **(i)**	$p + q = 12$	B1	
(ii)	$25p + 40q = 375$	B1	
(iii)	correct method $p = 7$ $q = 5$	M1 A1 A1	multiply and subtract, substitution SC3 for p=7 and q=5 www [12]
5 **(a)** **(i)**	43.0 art or 43	B2	M1 for π x 3.7^2
(ii)	10.0 art or 10	B2ft	M1 for 430 ÷ their **(a)(i)** ft
(b) **(i)**	(length) = 22.2 (width) = 14.8 (height) = 20	B1 B1 B1ft	accept length and width interchanged ft is 2 x their **(a)(ii)**
(ii)	6570 art	B2 ft	ft is their L x W x H from **(b)(i)** M1 for L x W x H ft (substituted)
(iii)	78.5 (%) art	B3 ft	ft is 5160 ÷ their **(b)(ii)** x 100 but only if answer < 100 B1 for 12 x 430 or 5160 M1 for 5160 ÷ their **(b)(ii)** x 100 [12]
6 **(a)** **(i)**	63	B1	
(ii)	54	B2 cao	M1 for 180 - 2 x their **(a)(i)** soi (may be implied by answer)
(iii)	134	B2 cao	M1 for 360 - (100 + 63 + their **(a)(i)**) or 197 - their **(a)(i)** soi (may be implied by answer)
(b) **(i)**	360 ÷ 8 or 6 x 180 180 - 45 or 1080 ÷ 8	MA1 MA1	 dependent SC2 for convincing argument

(ii)	octagon drawn accurate	M1 A1	closed and not re-entrant angles at A and B equal to 135 +/- 2 degrees and lines BC and AH equal to 4 +/- 0.1 cms
(iii)	4.7 to 5.0	B1	
(iv)	9.6	B2ft	ft is 2 x their **(b)(iii)** M1 for 0.5 x 4 x their **(b)(iii)**
(v)	76.8	B1 ft	ft is 8 x their **(b)(iv)** [13]
7 (a) (i)	tan (QPR) = 10.3 ÷ 7.2 55 (.0)	M1 E1	M1 for complete long method
(ii)	125	B1	cao
(b) (i)	125 - 98 or 180 - (98 + 55)	 E1	accept 55 + 98 + 27 = 180 do not accept 180 - 153
(ii)	6.13 art	B2cao	M1 for 13.5 x sin27 oe (allow full correct long methods) SCM1 for PR (pythag, sin or cos) RS (pythag) then A1 for 4.9 art or SCM1 for PR (pythag, sin or cos) RS(tan) then A1 for 6.4 art.
(iii)	37.1 or 37.13 art	B1 ft	ft is 31 + their **(b)(ii)**
(c)	8.24 to 8.25(1….)	B2 ft	M1 for their **(b)(iii)** ÷ 4.5 [9]
8 (a) (i)	$x + 3$	B1	
(ii)	$x(x + 3)$ or $x^2 + 3x$	B1	ft from their **(a)(i)**
(iii)	$x^2 + 3x = 7$ $x^2 + 3x - 7 = 0$	 E1	 both lines seen
(b) (i)	-3, -9, -3	B3	B1, B1, B1
(ii)	8 points correctly plotted smooth curve	P3 ft C1	P2ft or 6 or 7, P1ft for 4 or 5 (+/- 1/2 small square) (must go below $y = -9$)

(c)	**(i)**	1.5 to 1.6 -4.5 to -4.6	B1 ft B1 ft	ft is their intersections with the *x*-axis
	(ii)	4.5 to 4.6	B1 ft	ft is their positive **(c)(i)** + 3
(d)	**(i)**	correct line	L1	long enough to cross *y* axis (+/- 1/2 small square)
	(ii)	(*y* =) 2*x* - 3	B1,B1ft	B1 for 2 (as coefficient of *x*) B1 ft for their intersection with the *y*-axis [16]
9 **(a)**		Pentagon	B1	
(b)	**(i)**	61 to 63	B1	
	(ii)	AE = 6.3 to 6.5 cm and DE = 5.7 to 5.9 cm	 B1	
		correct arcs seen	B1	accept concave polygon SC1 if lengths reversed and with arcs
(c)	**(i)**	perpen.bisector of BC correct arcs seen	B1 B1	+/- 1mm and +/- 1 degree accuracy
	(ii)	bisector of angle ABC correct arcs seen	B1 B1	+/- 1 degree accuracy
(d)		"M" correctly marked	B1	dep. on at least first B1 in each part of **(c)**
(e)		2 marks 0.8 (+/-0.1) apart 1.85 (+/-0.1) from A and B	B1 B1	[11]