UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2010 question paper for the guidance of teachers

0607 CAMBRIDGE INTERNATIONAL MATHEMATICS

0607/03 Paper 3 (Core), maximum raw mark 96

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.

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UNIVERSITY of CAMBRIDGE
International Examinations

1	**(a)**	2.76×10^5	B1 [1]	
	(b)	135 930 (allow 135 900 and 136 000)	B2 [2]	If B0, M1 for $276000 \div 400 \times 197$
	(c) **(i)**	287040 (allow 287000)	B2 [2]	If B0, M1 for 276000×1.04 oe SC1 for 11040
	(ii)	290000 ft	B1**ft** [1]	ft their **(i)**, if at least 6 figures **[6]**
2	**(a)** **(i)**	7, 5, 5, 9, 6, 9 9, 5, 3, 1	B1 B1 [2]	
	(ii)	5, 5, 6, 7, 8, 9, 9 1, 1, 3, 4, 4, 5, 5, 5, 5, 5, 9, 9 0	 B1 **ft** [1]	
	(iii)	23.5	B1 **ft** [1]	Correct or ft their **(ii)**
	(b)	Columns for 23, 24, 25, 29 and 30 all correct	B3 **ft** [3]	B2 for 4 correct, B1 for 3 correct Correct or ft their **(ii)**
	(c)	10 ft	B2 **ft** [2]	ft their value in **(a)** (either **(i)** or **(ii)** if different) If B0, M1 for their frequency in **(a)** ÷ 20 × 100 **[9]**
3	**(a)** **(i)**	Triangle with vertices (–4, 4), (0, 4), (–4, 6)	B2 [2]	If B0, SC1 for any translation
	(ii)	Triangle with vertices (8, 2), (4, 2), (8, 4)	B2 [2]	If B0, SC1 for reflection in x-axis
	(iii)	Triangle with vertices (8, –2), (4, –2), (8, –4)	B2 [2]	If B0, SC1 for any other rotation by 180°
	(b)	Enlargement, (centre) (–8, 6) (scale factor) 3	B1, B1, B1 [3]	Each B1 independent All 0 if combination of transformations **[9]**
4	**(a)**	08 10	B1 [1]	Allow any reasonable form e.g. 8h 10
	(b) **(i)**	44.7 (44.73 – 44.74)	B2 [2]	If B0, M1 for $850 \div 19$
	(ii)	2.68 (2.682 to 2.684….) ft	B2 ft [2]	ft their **(i)** × 60 ÷ 1000 If B0, M1 for their **(i)** × 60 ÷ 1000
	(c)	8.5	B2 [2]	SC1 for 4.25 or M1 for 10 × 850 (implied by 8500) **[7]**
5	**(a)**	f(x) parabola shape, vertex (0, 0) g(x) parabola shape, vertex (1, 0)	B1, B1 B1, B1 [4]	
	(b)	Translation $\begin{pmatrix} 1 \\ 0 \end{pmatrix}$	B1, B1 [2]	Must be translation but vector can be described The two B1's are independent
	(c)	$x^2 + 3$	B2 [2]	B1 for f(x) + 3 **[8]**

6	**(a) (i)**	Accurate graph ruled for full domain	B2 [2]	If B0, SC1 for correct short line or correct full domain but freehand or gradient 0.5 or y – intercept 2
	(ii)	Points (0, 2) and (6, 5) correctly plotted	B1, B1 [2]	ft if B2 or SC1 in **(i)**
	(b)	(6, 2) plotted (condone absence of R) and triangle drawn	B1 [1]	Condone freehand and absence of labels
	(d)	26.6	B3 [3]	If B0, M1 for tan = $\frac{3}{6}$ oe, A1 for accurate answer to at least 2 dp (26.56 to 26.57 implies M1A1) **[8]**
7	**(a)**	Pentagon	B1 [1]	
	(b)	108	B1 [1]	
	(c)	540	B2 [2]	If B0, M1 for $(n - 2) \times 180$ oe seen or 540 seen
	(d)	120	B2 [2]	If B0, M1 for their (**(c)** – 180) ÷ 3
	(e) (i)	CD and AE drawn and meeting	B1 [1]	Condone absence of label and accept freehand
	(ii)	Trapezium	B1 [1]	
	(iii)	60 ft	B2 **ft** [2]	ft their 180 – 2 × (180 – their **(d)**) if positive If B0 M1 for 180 – 2 × (180 – their **(d)**) if positive
	(iv)	Equilateral dep or ft	B1 **ft** [1]	Dependent on **(iii)** correct or if **(d)** incorrect ft is isosceles **[11]**
8	**(a) (i)**	a, e, f	B1 [1]	
	(ii)	P'	B1 [1]	
	(iii)	$\{e, f\}$	B1 [1]	
	(iv)	6	B1 [1]	
	(b)	P but not Q shaded	B1 [1]	
	(c) (i)	$\frac{1}{7}$ oe	B1 [1]	
	(ii)	0	B1 [1]	Allow zero or $\frac{0}{7}$
	(d)	$\frac{1}{3}$ oe	B1 [1]	
	(e)	30	B2 [2]	If B0, M1 for $\frac{3}{7}$ soi or $\frac{1}{7} \times 70$ (implied by 10) **[10]**

9	**(a)**	$\frac{1}{5}$	B2 [2]	If B0, allow B1 for any correct fraction
	(b) **(i)**	6	B1 [1]	
	(ii)	22.07 (allow 22.1)	B1 [1]	
	(iii)	22.5	B1 [1]	
	(iv)	23	B1 [1]	
	(c)	111.6 (or 112)	B2 [2]	If B0, M1 for 31 ÷ 100 × 360 oe **[8]**
10	**(a)**	100	B1 [1]	
	(b) **(i)**	0.9	B3 [3]	If B0, M1 for 1.2 × 0.8, M1 for 0.5 × 0.4 × 0.3 (or 0.5 × 400 × 300), If collecting areas, M1 for a rectangle, M1 for a triangle or trapezium
	(ii)	90 ft	B1 **ft** [1]	ft their **(i)** × their **(a)**
	(c) **(i)**	3.8	B4 [4]	If B0, M1 for $0.3^2 + 0.4^2$ seen (or $300^2 + 400^2$), A1 for 0.5 (or 500) M1 for adding 5 lengths in same units. If 0, SC1 for 4 or 3.3
	(ii)	1710 ft	B1 **ft** [1]	ft their **(i)** × 450 **[10]**
11	**(a)**	Rectangular hyperbola	B3 [3]	B1 for curve through origin B1 for two branches B1 for Roughly having asymptotes parallel to axes
	(b)	$x = 2, y = 1$	B1, B1 [2]	
	(c)	$y \in R, y \neq 1$	B1, B1 [2]	Independent. Can accept either answer in words.
	(d) **(i)**	Line through origin sketched to meet hyperbola twice	B1 [1]	Can be freehand
	(ii)	0, 4 cao	B1, B1 [2]	**[10]**