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

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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)** $\div 20 \times 100$ **[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)** $\times 60 \div 1000$ If B0, M1 for their **(i)** $\times 60 \div 1000$
	(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 = ⅜ 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)	⅟₇ oe	B1	[1]	
		(ii)	0	B1	[1]	Allow zero or 0/7
	(d)		⅓ oe	B1	[1]	
	(e)		30	B2	[2]	If B0, M1 for ³⁄₇ soi or ⅟₇ × 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]**