UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2011 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.

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

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1	**(a)**	112	**1**	
	(b)	210	**1**	
	(c) (i)	2 : 3	**1**	
	(ii)	84	**FT2**	FT their **(b)** and **(c)(i)** **M1** for *their* 210 ÷ *their* 5 × 2 oe
	(iii)	1638	**FT2**	FT *their* **(b)** and **(c)(ii)** **B1** for either *their* **(c)(ii)** × 6 or *their* 126 × 9 soi
2	**(a)**	1090	**1**	
	(b)	900	**1**	
	(c)	700	**1**	
	(d)	30	**2**	**B1** for $\frac{3}{10}$ soi
	(e)	$\frac{6}{10}$ oe	**1**	isw
	(f)	950	**1**	
3	**(a)**	$8x + 6$ oe	**3**	**B2** for $kx + 6$ or $6x + k$ or **M1** for $2x - 6 + 6x + 12$
	(b)	$3x(x - 3y)$	**2**	**B1** for $x(3x - 9y)$ or $3(x^2 - 3xy)$
	(c)	3.5 oe	**2**	**M1** for $2x = 7$ oe
	(d)	12	**2**	**M1** for $2 \times 3 - 3 \times -2$ or better

4	**(a)**	Correct sketch	**2**	**B1** for smooth curve opening up **B1** for vertex on y-axis above –5
	(b)	(0, –4)	**1**	
	(c)	$x = 0$	**1**	
	(d)	$(y) \geqslant -4$ or $-4 \leqslant y \leqslant 5$	**1**	isw
	(e)	(–2, 0) (2, 0)	**2**	**B1** for each co-ordinate pair
	(f)	Correct sketch	**1**	Positive gradient with y-intercept above the origin
	(g)	(−2.21, 0.89) (– 2.212. , 0.8938 to 0.8939) (2.71, 3.36) (2.712…, 3.356.)	**2**	**B1** for any two or three co-ordinates correct
5	**(a)**	150	**2**	**B1** for $\frac{3}{100}$ soi
	(b)	5000×1.03^2 or $(5000 + 150) \times \frac{3}{100} + 5150$ oe	**M2**	**M1** for $(5000 + 150) \times \frac{3}{100}$
	(c) (i)	5627.54 (or 5630 or 5627 to 5628)	**2**	**M1** for continuing *their* sequence correctly for another year or for sight of compound interest formula
	(ii)	627.54 (or 630 or 627 to 628)	**FT1**	FT *their* **(c)(i)** – 5000
6	**(a)**	$6x$	**1**	
	(b)	$6x + 4y = 27$	**1**	
	(c)	$2x + 3y = 14$	**1**	
	(d)	$(x) = 2.5(0)$ $(y) = 3$	**FT3**	FT *their* **(b)** *and* **(c)** **M1** for elimination of one variable, condoning 1 numerical slip, or a sketch of the two straight lines. **A1A1** (**B1** if answers reversed in answer spaces) **SC1** for answers in either order if no working seen

7	**(a)**	20	**1**	
	(b)	38.3	**3**	**M2** for $\cos 40 = \frac{x}{50}$ oe If **M0** then **B1** for correct distance indicated on diagram
	(c)	220°	**1**	
8	**(a)**	$x = 140$, $y = 80$	**2**	**B1 B1** for each angle
	(b)	$p = 90$, $q = 150$	**2**	**B1 B1** for each angle
	(c) (i)	60	**1**	
	(ii)	120	**1**	
	(iii)	80	**1**	
	(d)	16	**4**	**M2** for $\sqrt{10^2 - 6^2}$ (**M1** for $x^2 + 6^2 = 10^2$) **M1ft** for *their* $\sqrt{\ }$ × 2 **but** only if answer less than 20
9	**(a)**	150	**1**	
	(b)	130 (129 – 131)	**1**	
	(c) (i)	15	**FT1**	*their* **(a)**
	(ii)	64 to 66	**FT2**	*their* **(c)(i)** **M1** *their* **(a)** – **(c)(i)**

10	**(a)**	Kite	**1**	
	(b)	Reflection, x-axis ($y = 0$) or Rotation 180°, centre (4, 0) or Enlargement scale factor –1, centre (4, 0)	**2**	**B1 B1** independent **B1** for 180°, **B1** for centre (4, 0) **B1** for scale factor –1, **B1** for centre (4, 0)
	(c)	Translation $\begin{pmatrix} -12 \\ -10 \end{pmatrix}$	**2**	**B1 B1** independent
	(d)	Correct rotation	**2**	**B1** for any 90° rotation with any centre
	(e)	Correct enlargement	**2**	**B1** for any enlargement scale factor 2
11	**(a) (i)**	3	**1**	
	(ii)	4	**FT1**	7 – *their* **(a)(i)**
	(b)	24	**FT1**	6 × *their* **(a)(ii)**
	(c)	14	**FT3**	FT $\pi \times$ *their* 3^2 **M1** for $\pi \times$ *their* 3^2 **A2** or **A1** for 14.13 to 14.14 **SC1ft** for answer to 2 significant figures if seen with more
	(d)	1 330 000 (1 334 000 to 1 335 000)	**FT2**	FT (*their* **(b)** + *their* **(c)**) ×35000 **M1** for (*their* **(b)** + *their* **(c)**) ×35 soi
	(e) (i)	20	**2**	**M1** for 35 ÷ 105 soi
	(ii)	32	**FT2**	FT 52 – *their* **(e)(i) B1** for 52 minutes seen

12	**(a)**	$\frac{8}{12}$ oe (0.667 or 0.6666 to 0.6667)	**1**	
	(b)	$\frac{7}{11}$ (0.636 or 0.6363 to 0.6364)	**2**	**B1** for 7 as numerator, **B1** for 11 as denominator.
	(c)	$\frac{8}{12}, \frac{4}{12}$ $\frac{7}{11}, \frac{4}{11}$ $\frac{8}{11}, \frac{3}{11}$	**FT2**	*their* **(a)** and *their* **(b)** **B1** for any one correct pair
	(d)	$\frac{64}{132}$ oe (0.485 or 0.4848…)	**FT3**	**M1** for one (*their*) correct pair multiplied **M1** for addition of two fractions