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

0580 MATHEMATICS

0580/22 Paper 2 (Extended), maximum raw mark 70

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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Abbreviations

cao correct answer only
cso correct solution only
dep dependent
ft follow through after error
isw ignore subsequent working
oe or equivalent
SC Special Case
www without wrong working

Qu.	Answers	Mark	Part Marks
1	35	**2**	**M1** for $4 \times 8 + 3$ or $4 \times 8\frac{3}{4}$ or $4 \times 8\frac{1}{2} + 1$ or $\frac{525}{15}$ or $\frac{510}{15} + 1$ **SC1** for answer 34
2	$(a + b)(x + y)$	**2**	**M1** $x(a + b) + y(a + b)$ or **M1** $a(x + y) + b(x + y)$
3	**(a)** 6.25 cao **(b)** 0.16 cao	**1** **1**	
4	12375 cao 12825 cao	**2**	**B1, B1** If no marks scored give **M1** for 27.5 and 28.5 seen
5	$2\frac{1}{12}$ cao **with correct working**	**3**	**M1** $(1+)\frac{6}{12} + \frac{4}{12} + \frac{3}{12}$ oe **A1** $(1)\frac{13}{12}$ or $\frac{25}{12}$ oe
6	37.5	**3**	**M1** $F = k/d^2$ **A1** $k = 600$
7	$a = -3$ $b = 4$	**3**	**M1** $-3a + 4b = 25$ **B1** one correct
8	11.3	**3**	**M2** $22 \times 1.852 \times 1000/3600$ oe or **M1** $22 \times$ figs 1852 or $22 \times 1000/3600$
9	**(a)** $\sqrt{(2n-1)}$ **(b)** $\sqrt{57}$ or 7.55	**2** **1ft**	**M1** $\sqrt{(2n+k)}$ or $2n - 1$ From their **(a)**
10	$\frac{2x+2}{(x+10)(x+4)}$ oe	**3**	**B1** common denominator $(x + 10)(x + 4)$ oe seen **B1** $3(x + 4) - (x + 10)$ seen oe
11	**(a)** –3 **(b)** 1.5	**2** **2**	**M1** $1/2^3$ or 2^{-3} **M1** 2^{6n} or $6n = 9$
12	80 www	**4**	**M1** attempting area under the graph **M1** large or small car area found correctly **Dep M1** correct final area statement
13	**(a)** 52 **(b)** 322	**2** **2**	**M1** OAB or $OBA = 38$ or $OCT = 90$ **M1** $BCT = 38$ or $BCO = 52$

14	$y \leq 5$ $x \geq 2$ $y \geq x$	**4**	**B1** each inequality but accept **any** of the f inequality symbols Final **B1** all 3 symbols correct
15	**(a)** (3, 3½)	**1**	
	(b) $\begin{pmatrix} 4 \\ 3 \end{pmatrix}$	**1**	
	(c) Correct perpendicular bisector with arcs	**2**	**B1** line through (3, 3½) perp to *AB* **B1** two sets of correct arcs
16	**(a)** Petrol cao	**1**	
	(b) 72	**2**	**M1** for 360 × 12 ÷ 60
	(c) $\frac{1}{10}$	**2**	**B1** $\frac{6}{60}$ or $\frac{3}{30}$ or $\frac{2}{20}$ or 0.1 or 10%
17	**(a)** **(i)** 3**a** + **c**	**2**	**B1** ***AO*** + ***OC*** + ***CB*** or –**a** + **c** + 4**a**
	(ii) $2\frac{1}{2}$**a** + $\frac{1}{2}$**c** oe	**2**	**M1** **a** + $\frac{1}{2}$ their **(a)(i)**
	(b) *D* marked ¾ way along *CB*	**2**	**B1** *D* on *CB*
18	**(a)** 2.5×10^5	**3**	**B2** 250000 oe or **M1** correct part value seen
	(b) $C = 1/(Lw^2)$	**3**	**M1** each correct move
19	**(a)** correct bisector (through 3½, 3½)	**2**	**B1** correct line **B1** correct arcs
	(b) $y = 1\frac{1}{2}x - 5$ oe	**3**	**B2** $y = 1\frac{1}{2}x + k$ or $y = kx - 5$ k any number or **B1** $1\frac{1}{2}x + k$ or $kx - 5$ If O scored allow one each for $m = 1\frac{1}{2}$ or $c = -5$ clearly identified in working
	(c) 3.61	**2**	**M1** $\frac{1}{2} \times L \times L = 6.5$ or **M1** $\sqrt{(3^2 + 2^2)}$