MARK SCHEME for the October/November 2011 question paper

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for the guidance of teachers

0580 MATHEMATICS

0580/22

Paper 2 (Extended), maximum raw mark 70

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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	1	
	(b) 0.16 cao	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 × 1.852 × 1000/3600 oe or M1 22 × figs 1852 or 22 × 1000/3600
9	(a) $\sqrt{(2n-1)}$	2	M1 $\sqrt{(2n+k)}$ or $2n-1$
	(b) $\sqrt{57}$ or 7.55	1ft	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	2	M1 $1/2^3$ or 2^{-3}
	(b) 1.5	2	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	2	M1 <i>OAB</i> or <i>OBA</i> = 38 or <i>OCT</i> = 90
	(b) 322	2	M1 <i>BCT</i> = 38 or <i>BCO</i> = 52

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14	$y \le 5$ $x \ge 2$	4	B1 each inequality but accept any of the four inequality symbols
	$y \ge x$		Final B1 all 3 symbols correct
15	(a) $(3, 3\frac{1}{2})$	1	
	(b) $\begin{pmatrix} 4 \\ 3 \end{pmatrix}$	1	
	(c) Correct perpendicular bisector with arcs	2	B1 line through (3, 3 ¹ / ₂) perp to <i>AB</i> 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) $3a + c$	2	B1 $AO + OC + CB$ or $-a + c + 4a$
	(ii) $2\frac{1}{2}a + \frac{1}{2}c$ oe	2	M1 a + $\frac{1}{2}$ their (a)(i)
	(b) D marked $\frac{3}{4}$ way along CB	2	B1 <i>D</i> on <i>CB</i>
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 $3\frac{1}{2}$, $3\frac{1}{2}$)	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 $\frac{1}{2}$ × <i>L</i> × <i>L</i> = 6.5 or M1 $\sqrt{3^2 + 2^2}$