MARK SCHEME for the October/November 2011 question paper

for the guidance of teachers

0580 MATHEMATICS

0580/23   Paper 2 (Extended), maximum raw mark 70

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	112	2	**M1** for $240 \div (7 + 8) \times 7$
2	**(a)** 211 cao	1	
	(b) 216 cao	1	
3	$(x =) -3 \quad (y =) 5$	2	**M1** for correctly eliminating one variable
4	$\dfrac{16}{81}$ cao	2	**B1** for $\dfrac{81}{16}, \dfrac{k}{81}, \dfrac{16}{k}$ or $(2/3)^4$ seen
5	**(a)** 1.28×10^5	1	
	(b) 128 500	1	
6	882	2	**M1** $800 \times 1.05 \times 1.05$
7	$\dfrac{1}{9}, \dfrac{1}{4}$	**M1**	Both fractions seen
	$\left(\dfrac{1}{9} + \dfrac{1}{4} = \right) \dfrac{4}{36} + \dfrac{9}{36} = \dfrac{13}{36}$	**E1**	Both fractions over a common denominator and added to give $\dfrac{13}{36}$
8	0.186	2	**B1** for 2.477 to 2.478 or 13.29… seen
9	**(a)** 5 or –5	1	
	(b) -0.714 $(-0.7143$ to $-0.7142)$ or $-\dfrac{5}{7}$	2	**M1** for $-2 + 2 + 1 - 3 - 1 - 2$ and $\div 7$
10	9 h 12 min	3	**M1** for 8×1.15 **A1** for 9.2 **B1 ft** independent for their 9.2 correctly converted into hours and minutes
11	$x(p - 2q)(p + 2q)$	3	**M2** for $(px - 2qx)(p + 2q)$ or $(p - 2q)(px + 2qx)$ or **M1** for $x(p^2 - 4q^2)$
12	225.(23112)	3	**M2** for $(800 \div 3.8235 - 150) \times 3.8025$ **M1** for $800 \div 3.8235$
13	68.5 www	3	**M2** for $67.13 \div 0.98$ or **M1** for 67.13 is 98%
14	$66\dfrac{2}{3}$ or 66.7 www	3	**M2** for $\dfrac{\frac{4}{3}\pi r^3}{\pi r^2 (2r)}$ $(\times 100)$ or **M1** for $\pi r^2 (2r)$
15	$p = \dfrac{c}{a - x}$	3	**M1** one correct move **M1** second correct move **M1** third correct move marked on answer line

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16	**(a)** $t = 2\sqrt{l}$	2	**M1** for $t = k\sqrt{l}$
	(b) 3	1ft	Ft dependent on using $t = k\sqrt{l}$
17	**(ii)** 7	1	
	(ii) 4	1	
	(b) $\dfrac{7}{13}$ oe	1ft	Ft their Venn diagram or their **(a)(i)**/13
18	$\dfrac{1 - 5x + x^2}{x(1 - 2x)}$ or $\dfrac{1 - 5x + x^2}{x - 2x^2}$	4	**M1** for $(1 - x)(1 - 2x) - x(2 + x)$ seen **B1** for $1 - x - 2x + 2x^2$ or $1 - 3x + 2x^2$ seen **B1** for $x(1 - 2x)$ oe as a common denominator
19	4.32	4	**M1** for $\dfrac{50}{360} \times \pi \times 9^2$ **M1** for $0.5 \times 9^2 \times \sin 50$ **M1** for subtracting their triangle from their sector (dependent on at least M1)
20	**(a) (i)** 2×2	1	
	(ii) (20)	1	Brackets essential
	(b) $\dfrac{1}{2}\begin{pmatrix} 4 & -3 \\ -2 & 2 \end{pmatrix}$ oe	2	**M1** for $\dfrac{1}{2}\begin{pmatrix} a & b \\ c & d \end{pmatrix}$ or $k\begin{pmatrix} 4 & -3 \\ -2 & 2 \end{pmatrix}$ seen
21	**(a)** 84(.00..)	4	**M2** for $\cos(\ldots) = \dfrac{2.7^2 + 4.5^2 - 5^2}{2 \times 2.7 \times 4.5}$ or (**M1** for $5^2 = 2.7^2 + 4.5^2 - 2 \times 2.7 \times 4.5 \times \cos C$) **A1** for 0.1045… (implied by correct answer)
	(b) 136	1ft	220 – their **(a)**
22	**(a)** Angles in same segment	1	
	(b) (i) 8.2(0)	2	**M1** for $\dfrac{CX}{3.84} = \dfrac{9.4}{4.4}$ $(= 2.136)$ oe
	(ii) 24.7	2	**M1** for $\dfrac{\Delta}{5.41} = \left(\dfrac{9.4}{4.4}\right)^2$ $(= 4.564)$ oe
23	**(a)** 0.133 (3…) or $\dfrac{2}{15}$	2	**M1** for $40 \div 300$ seen
	(b) $33\dfrac{1}{3}$ or 33.3	3	**M1** for area under graph attempted **M1** for correct total area statement