

**MARK SCHEME for the May/June 2011 question paper
for the guidance of teachers**

0581 MATHEMATICS

0581/22

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 Mark
1	53.1	2	B1 C = 36.9 seen, must have C stated or marked on the diagram or M1 $\sin A = \frac{4}{5}$ or $\tan A = \frac{4}{3}$ but must have A stated
2	$\sqrt{3} + \sqrt{6}, \pi$	2	-1 for each error or omission
3	Working must be shown	2	M1 $\frac{14}{9}$ and $\frac{16}{9}$ M1 $\frac{14}{16} = \frac{7}{8}$ oe or visible cancelling
4	0.8^2	2	M1 conversion of $\frac{16}{27}$ (= 0.5(9...)) and 0.8^2 (= 0.64) to decimals seen
5	(6)€ or euros (with correct working)	2	M1 one of 6×1.9037 or $11.5 \div 1.9037$ or $11.5 \div 6$ seen
6	3.322 cao	2	B1 3.3219(...) or 3.32(20) seen
7	1.85×10^4	3	B2 18500 oe seen or M1 $4x = 74000$ or $x = 2 \times 10^4 - 1.5 \times 10^3$
8	16	3	M1 $p = k\sqrt{q}$ A1 $k = 1.6$ or $8/5$
9	1275, 1425	3	B1 85 or 95 or 0.85 or 0.95 M1 their LB or UB $\times 1500$ where $85 \leq \text{LB} < 90$ $90 < \text{UB} \leq 95$
10	(a) (0)700 or 7 am (b) 1700 or 5 pm	2 1	M1 $100 - (5 \times \text{their}(22 - 6) + \text{their}(13 - 8))$ or better soi
11	$\frac{4+bc}{c}$ or $\frac{4}{c} + b$ cao	3	M1 correct move completed M1 second correct move completed M1 third correct move completed
12	$x = 1$ $y = 0.2$ or $\frac{1}{5}$ only	3	M1 consistent mult and add/subtraction A1 one value correct after M awarded
13	(a) 72 (b) 36 (c) 54	1 1 2ft	ft 90 - (b) M1 $POQ = 108$

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14	(a) 84	1	
	(b) 15	1	
	(c) 6.28	2	M1 $\frac{120}{360} \times 2 \times \pi \times 3$ oe
15	$\frac{1-3x}{(x+1)(x+5)}$ www	4	M1 $(x+1)^2 - x(x+5)$ oe B1 $x^2 + x + x + 1$ B1 denominator(s) $(x+1)(x+5)$ or $x^2 + 6x + 5$
16	(a) $\frac{1}{2}a - \frac{1}{2}c$ oe	2	M1 correct but unsimplified e.g. $\frac{1}{2}a + -\frac{1}{2}c$
	(b) $\frac{3}{4}a + \frac{3}{4}c$ oe	2	M1 correct but unsimplified
17	(a) $4x^{-24}$ or $\frac{4}{x^{24}}$	2	B1 $4x^n$ B1 $\frac{k}{x^{24}}$ or kx^{-24} for any numerical k, n
	(b) $\frac{x^2}{16}$	2	B1 $\frac{x^2}{k}$ or B1 $\frac{x^n}{16}$ SC1 $(\frac{x}{4})^2$
18	(a) $(6, 1\frac{1}{2})$	1	
	(b) $y = -\frac{1}{5}x + 4$ oe	3	B1 correct numerical format B1 correct m B1 correct c
19	(a) 8	1	
	(b) $4x - 9$	2	M1 $2(2x - 3) - 3$ seen
	(c) $2^{2(x+1)}$ or 2^{2x+2} or 4^{x+1}	2	M1 $(2^{x+1})^2$ seen
20	(a) (i)	2	B1 correct line B1 2 sets of correct arcs
	(ii)	2	B1 correct line B1 two sets of correct arcs
	(b)	1	correct region, shaded or shown by the letter R
21	(a) (i) (0) brackets essential	2	M1 $6 \times 2 + 3 \times -4$ or $12 + -12$
	(ii) $\begin{pmatrix} 12 & 18 \\ -8 & -12 \end{pmatrix}$	2	M1 any 2×2 matrix with 2 elements correct
	(b) $\frac{1}{2} \begin{pmatrix} 1 & -1 \\ -1 & 3 \end{pmatrix}$	2	B1 $\frac{1}{2} \begin{pmatrix} a & c \\ b & d \end{pmatrix}$ seen or B1 $k \begin{pmatrix} 1 & -1 \\ -1 & 3 \end{pmatrix}$ seen