MARK SCHEME for the May/June 2011 question paper

for the guidance of teachers

0580 MATHEMATICS

0580/21

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.

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

• Cambridge will not enter into discussions or correspondence in connection with these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2011 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.



Page 2	Mark Scheme: Teachers' version	Syllabus	Paper
	IGCSE – May/June 2011	0580	21

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	847	1	
2	correct regions shaded	1, 1	
3	48	2	B1 for 3 and 16 seen
4	(a) 10	1	
	(b) 5.5 oe	1	
5	(a) 86400	1	
	(b) 8.64×10^4	1ft	
6	108	2	M1 for 3 ³ or 27 or $\left(\frac{1}{3}\right)^3$ or $\frac{1}{27}$ seen
7	13	3	B1 for 12, 5 seen M1 for (their 12) ² + (their 5) ² or M2 $\sqrt{[(-8-4)^2 + (1-6)^2]}$ oe or M1 if $\sqrt{\text{missing}}$
8	6.70	3	M1 for $(r^3 =)$ 1260 × $\frac{3}{4\pi}$ oe seen M1 for $\sqrt[3]{}$ of their r^3 seen or implied
9	22.5 oe	3	B2 $180 = 5x + 2x + x$ oe or better
			B1 for $2x$ or $6x$ marked in the correct place on the diagram.
10	$ \begin{array}{l} x = 13 \\ y = -9 \end{array} $	3	M1 for consistent multiplication and addition/subtraction A1 for $x = 13$ or A1 for $y = -9$
11	(a) 85.8	2	M1 for 23.25 and 19.65 seen
	(b) 456.8625 cao	1	
12	(a) (0)8(.)01 (am)	1	Not 8.01pm
	(b) 78.4 or 78.38 to 78.39	3	M2 for 827 ÷ 10.55 or M1 for figs 827 ÷ their time
13	(a) 0.54	2	M1 for $\frac{2.7 \times 20000}{100000}$ oe
			or SC1 for figs 54 in answer
	(b) 1.61	2	SC1 for figs 161 or M1 200 ² or 20 000 ² seen

		: Teachers' version		Paper	
	IGCSE –	May/June 2011	0580	21	
14	-2.64, 1.14 cao with working	B1 for the for After H	$p = -3$ and $r = 2 \times 2$ or better m $\frac{p + \sqrt{q}}{r}$ or $\frac{p - \sqrt{q}}{r}$, SC1 for –2.6 or –2.637(45)	
15	(a) 4 (b) (i) $\frac{12}{36}$ or 0.333 (ii) $\frac{11}{36}$, 0.306 or 0.3055 to 0.3056 (c) $\frac{8}{15}$ or 0.533(3)	1 1 1 1			
16	(a) Answer given (b) $k = (\pm) \sqrt{\frac{4A}{(4-\pi)}}$ or $2\sqrt{\frac{A}{(4-\pi)}}$	E1 A = correct 3 M1 fac M1 div	$=)k^{2} - \pi \left(\frac{k}{2}\right)^{2}$ $= k^{2} - \frac{\pi k^{2}}{4}$ In the second	2	
17	 (a) 66° (b) 33° 	2 M1 for 1	90° clearly identified as A		
18	(c) 123° (a) (i) -r + q or q − r (ii) ½(3q − r) oe (b) correct working	1 1 Must b 3 M1 for M1 ust	$OBA \text{ or } OAB = 57^{\circ}$ we simplified $MX = \frac{1}{2} \mathbf{r} + \frac{3}{4} \text{ their } (-\mathbf{r} + \mathbf{q})$ ing a different route for XS or		
19	(a) 480(b) 9900	1 3 M1 for M1 for	e attempt at area under graph $0.5 \times 15 \times (\text{their } (\mathbf{a}) + 14 \times 6 \times 15 \times (8 + 14) \text{ oe}$		
20	(c) $0.125 \text{ or } \frac{1}{8}$ (a) (i) 9 (ii) $8x^3$ cao	1 1 1	r numerical vertical/horizontal $v = u + at$ but $t \le 120$ or $t \le 2$		
	(b) 4 www (c) $\frac{x+3}{2}$		$(2x-3)^3 = 125$ M1 $2x-3 = 5$ $x \pm 3 = 2y$ or $x = \frac{y \pm 3}{2}$	5	