

**MARK SCHEME for the October/November 2010 question paper
for the guidance of teachers**

0580 MATHEMATICS

0580/23

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.

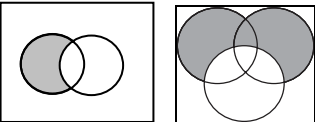
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Page 2	Mark Scheme: Teachers' version	Syllabus	Paper
	IGCSE – October/November 2010	0580	23

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	-8.3	1	Allow $-8\frac{3}{10}$
2	21 55	1	Allow 9.55 pm
3	1.6305 cao	2	B1 4.33(44...) seen or answer 1.63, 1.630, 1.6304....
4		1, 1	
5	Correct working	2	M1 $\frac{15}{4} + \frac{4}{3} = \frac{45}{12} + \frac{16}{12}$ M1 $\frac{61}{12} = 5\frac{1}{12}$
6	$4.93\% < \frac{20}{41} < 0.492 < \frac{80}{161}$	2	Allow decimal equivalents in answer space M1 decimals 0.48(78..), 0.496(8..), 0.0493
7	1.14	2	M1 $3.38 \div 1.04 (= 3.25)$ or M1 4.39×1.04
8	1200	2	M1 figs $8 \div 40 \times$ figs $9 \div 15$ or M1 (figs $8 \times$ figs 9) $\div (40 \times 15)$
9	9.6 cao	2	M1 $\frac{x}{8} = \frac{12}{10}$ oe
10	216.32 cao	2	M1 $200 \times (1 + (4/100))^2$ oe
11	13	2	M1 $21 + 15 - 23$ or M1 $15 - x + x + 21 - x + 1 = 24$ oe
12	(a) 25 (b) 0.4	1 1	If zero scored SC1 for 250 and 4 or 6.25 and 6.35
13	$10a + b$ or $a \times 10^1 + b (\times 10^0)$	2	M1 $[a \times 10^7 + b \times 10^6] \div 10^6$

Page 3	Mark Scheme: Teachers' version	Syllabus	Paper
	IGCSE – October/November 2010	0580	23

14	10.8 or $10\frac{70}{83}$	3	M1 figs $10 \div$ time M1 $10 \div 0.92r$, 0.922 or $83/90$
15	$y = -2x + 8$ cao oe	3	M1 ($m =$) $\frac{8-2}{0-3}$ oe B1 $c = 8$ or $y = mx + 8$ or subst. correct point in $y = "m" x + c$
16	$\frac{4h}{g^2}$ or $h\left(\frac{2}{g}\right)^2$	3	M1 squaring correctly M1 clearing denominator correctly M1 dividing by coefficient of i or SC2 for correct unsimplified expression
17	$x = -1, y = 5$	3	M1 consistent multiplication and either add or subtract A1 for one correct after M1
18	315	3	M1 $\frac{x}{360} \times 2 \times \pi \times 8$ oe M1 $\frac{x}{360} \times 2 \times \pi \times 8 (+ 16) = (16 +) 14\pi$
19	2.88	3	M1 40^3 oe seen A1 2 880 000 B1ft their $2\ 880\ 000 \div 100^3$ or B1 0.000045 M1 40^3 A1 cao or M1 0.4^3 M1 45×0.4^3 A1
20	(a) 63.4 (b) Vertices at (4, 1), (8, 1) and (10, 3)	2 2	M1 $\tan(M) = \frac{4}{2}$ oe B1 two vertices correct
21	(a) 2.4 oe (b) 680	1 3	 M1 an area found M1 $40 \times 20 - \frac{1}{2} \times 20 \times 12$ oe
22	$y \geq 1, x \leq 3, y \leq x + 5$ oe	5	B1 $y R 1$ B1 $x R 3$ B2 $y R x + 5$ or B1 $y R -x + 5$ where R is any inequality B1 all 3 inequalities correct
23	(a) (Angles in) same segment (b) (i) 100 (ii) 43 (iii) 3	1 1 1 2	Allow (angles on) the same arc B1 OBC or $OCB = \frac{1}{2}(180 - 86) (= 47)$

Page 4	Mark Scheme: Teachers' version	Syllabus	Paper
	IGCSE – October/November 2010	0580	23

24	(a) $\frac{x-2y}{xy}$	2	B1 correct numerator B1 correct denominator
	(b) $\frac{x}{3}$ www	3	M1 $x(x+1)$ M1 $3(x+1)$
25	(a) -3	2	B1 $g\left(\frac{1}{2}\right) = 2$ or $fg(x) = \frac{2}{x} - 7$ oe
	(b) $\frac{1}{2x-7}$	1	
	(c) $\frac{x+7}{2}$	2	M1 for $y+7=2x$ or $x=2y-7$