

MARK SCHEME for the October/November 2013 series

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 should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

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Abbreviations

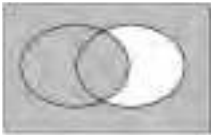
cao	correct answer only
cso	correct solution only
dep	dependent
ft	follow through after error
isw	ignore subsequent working
oe	or equivalent
SC	Special Case
www	without wrong working

Qu.	Answers	Mark	Part Marks
1	86.7 or 86.74 to 86.75	1	
2	5.293 cao	2	B1 for 5.29 or 5.292 to 5.2927
3	125	2	B1 for 55 or 125 in any other correct position on diagram or M1 for 180–55
4	7.7	2	M1 for $44 \times \frac{17.5}{100}$ oe
5	4.8 oe	2	M1 for $5 + 19 = 3x + 2x$ oe or better or B1 for $24 - 2x = 3x$ oe or $5 = 5x - 19$ oe
6	(a) $\frac{2}{6}$ oe (b) 200	1 1FT	 FT $600 \times$ <i>their (a)</i> providing <i>their (a)</i> is a probability
7	435, 445 cao	2	B1 for one value in the correct place or SC1 for both values correct but reversed
8	134	3	M2 for $\frac{20.1 \times 100}{3 \times 5}$ oe or M1 for $\frac{x \times 3 \times 5}{100} = 20.1$ or $3\% = 4.02$ oe If 0 scored SC1 for answer of figs 134
9	(a) $\frac{n}{n+2}$ oe final answer (b) n^2-1 oe final answer	1 2	 B1 for any quadratic in final answer
10	$[\pm] \sqrt{c^2 - a^2}$ oe final answer	3	M1 for correct square M1 for correct re-arrangement M1 for correct square root

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11	150	3	M1 for m^3 to cm^3 or cm^3 to m^3
12	(a) 110 (b) 79	1 2	B1 for $DAC = 42$ or $ACB = 79$ or $ACD = 28$
13	(a) $\frac{5}{4}$ oe (b) $4y^6$	1 2	B1 for ky^6 or y^6 or $4y^k$ or 4 as final answer
14	$\frac{2t-5}{t-1}$ final answer	3	B1 for $\frac{3(t-1)}{t-1}$ or better B1 for $3(t-1) - (t+2)$ oe or better
15	(a) $\frac{9}{12} - \frac{1}{12}$ oe [=] $\frac{8}{12}$ oe [=] $\frac{2}{3}$ (b) $\frac{5}{2} \times \frac{4}{25}$ oe Cancelling shown or $\frac{20}{50}$ oe [=] $\frac{2}{5}$	M1 M1 M1 M1	Must be shown Both fractions must be shown Must be shown Dependent and cancelling shown or a fraction and then $\frac{2}{5}$ must be shown
16	(a) $\binom{9}{6}$ (b) 10.8 or 10.81 to 10.82 (c) (17, 13)	1 2FT 1FT	M1 for $\sqrt{(their\ 9)^2 + (their\ 6)^2}$ A1 for 10.8 or FT correctly evaluated FT <i>their</i> 9 and 6. (8 + <i>their</i> 9, 7 + <i>their</i> 6) correctly evaluated
17	(a) $(a+b)(1+t)$ (b) $(x-6)(x+4)$	2 2	B1 for $1(a+b) + t(a+b)$ or $a(1+t) + b(1+t)$ SC1 for answer of $(x+a)(x+b)$ where $ab = -24$ or $a+b = -2$
18	486 cao	4	M1 for $\frac{1}{2} \times 4\pi^2 + \pi^2 = 243\pi$ or better A1 for $[r=] 9$ M1 for $\frac{1}{2} \times \frac{4}{3} [\pi] (their\ r)^3$

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19	(a) 40 (b) 3.5	2 2FT	M1 for $\frac{144 \times 1000}{60 \times 60}$ oe FT 140 \div <i>their</i> (a) M1 for dist \div <i>their</i> (a) or dist \div 40 or dist $\times \frac{60 \times 60}{144 \times 1000}$ or B1 for 140 seen
20	(a) (i) Accurate bisector of angle B with correct arcs (ii) Accurate perpendicular bisector of BC with correct arcs (b) correct region shaded	2 2 1	B1 for correct line or correct arcs B1 for correct line or correct arcs
21	(a) 73.7 or 73.73 to 73.74 (b) 120	3 2	M1 for $\frac{20}{3+2} \times 2$ or B1 for $BX = 8$ M1 for $\tan [] = \frac{6}{\text{their } 8}$ or better M1 for $\frac{1}{2} \times 20 \times 12$ oe
22	(a) (i) $\frac{5}{50}$ oe (ii) $\frac{11}{50}$ oe (b) $\frac{11}{16}$ oe (c) $\frac{380}{2450}$ oe (d) 	1 1 1 2 1	M1 for $\frac{20}{50} \times \frac{19}{49}$