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Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

MATHEMATICS

0580/02

Paper 2 (Extended)

For Examination from 2015

SPECIMEN MARK SCHEME

1 hour 30 minutes

MAXIMUM MARK: 70

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **4** printed pages.



Types of mark

- M** marks are given for a correct method.
A marks are given for an accurate answer following a correct method.
B marks are given for a correct statement or step.
D marks are given for a clear and appropriately accurate drawing.
P marks are given for accurate plotting of points.
E marks are given for correctly explaining or establishing a given result.
SC marks are given for special cases that are worthy of some credit.

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
 art anything rounding to
 soi seen or implied

Qu.	Answers	Mark	Part Marks
1	7.5(0) cao	2	M1 for $\frac{258.75}{4.6}$
2	3×10^{27}	2	M1 for $6 \div (2 \times 10^{-27})$
3	cos38 sin38 sin158 cos158	2	M1 correct decimals seen 0.7(88..) 0.6(15..) 0.3(74..) -0.9(271..)
4	$\frac{41}{333}$	3	B2 for $\frac{123}{999}$ oe fraction or M1 for $1000[x] = 123.123... \text{ oe}$
5	(a) 7853 to 7855 or 7850 or 7860 www (b) 0.7853 to 0.7855 or 0.785 or 0.786	2 1ft	M1 for $\pi \times 50^2$ Their (a) $\div 10\,000$ evaluated
6	135 cao	3	M1 for 720 or $(6 - 2) \times 180$ oe seen in working and M1 for equation $180 + 4x = \text{their } 720$ or M1 for $(360 - 180) \div 4 (= 45)$ oe seen in working and M1 dep for $180 - \text{their } 45$
7	(a) ($y =$) 80 (b) ($z =$) 40 (c) ($t =$) 10	1 1 1ft	Follow through 90 – their y or 50 – their z

8	$y = -\frac{1}{2}x + 10$ oe	3	M2 for $-\frac{1}{2}x + 10$ or M1 for gradient identified as $-\frac{1}{2}$ or intercept as 10 (not on diagram) e.g. $y = mx + 10$ or $y = -\frac{1}{2}x + c$
9	(a) Correct perpendicular bisector with arcs (b) 60°	2 1	B1 correct line B1 correct construction arcs
10	0.38 or $\frac{19}{50}$	4	B1 0.8, 0.6 or 0.55 then M1 $0.45 \times \text{their } 0.6$ M1 $0.2 \times \text{their } 0.55$ or M2 $1 - (0.45 \times 0.4 + 0.55 \times \text{their } 0.8)$
11	(a) $\begin{pmatrix} 8 & 5 \\ 20 & 13 \end{pmatrix}$ (b) $\begin{pmatrix} 1\frac{1}{2} & -\frac{1}{2} \\ -2 & 1 \end{pmatrix}$ oe	2 2	B1 two or three entries correct B1 $\frac{1}{2}\begin{pmatrix} a & c \\ b & d \end{pmatrix}$ B1 $(k)\begin{pmatrix} 3 & -1 \\ -4 & 2 \end{pmatrix}$
12	(a) Negative (b) Correct point (c) (i) Accurate ruled line (ii) English mark	1 1 1 1ft	Ignore embellishments Follow through their (c)(i)
13	(a) $\frac{1}{2}\mathbf{a} + \frac{1}{2}\mathbf{b}$ oe (b) $-1\frac{1}{2}\mathbf{a} + 1\frac{1}{2}\mathbf{b}$ oe	2 2	M1 unsimplified or any correct route e.g. $\mathbf{a} + \frac{1}{2}(\mathbf{b} - \mathbf{a})$ or $\mathbf{OA} + \mathbf{AC}$ M1 unsimplified or any correct route e.g. $\mathbf{CD} = 1\frac{1}{2}\mathbf{AB}$ or $\mathbf{b} - \mathbf{a} + \frac{1}{2}(\mathbf{b} - \mathbf{a})$
14	(a) 2.84 (b) $\frac{4\pi^2\ell}{T^2}$ oe	2 3	M1 correct substitution of g and ℓ seen M1 each correct move but third move marked on answer line
15	(a) 156 (b) 12	4 1ft	M1 intention to find area under graph B2 completely correct area statement or B1 two areas found correctly (or one trapezium area) Their (a)/13

16	(a) 500, 405, 364–365, 295 (...) (b) 5 points plotted within correct square correct curve drawn within 1 mm of points plotted (c) (i) 3.3–3.4 (ii) Never oe	2 1 1 1 1	B2 P1 ft from table C1 B1 ft from their curve or line reading at 350 g
17	(a) $\frac{1}{2}$ (b) $\sqrt[3]{x-1}$ or $\sqrt[3]{x-1}$ (c) 1 2	2 2 3	B1 f(-2) seen M1 $x-1 = y^3$ or $\sqrt[3]{y-1}$ M2 $(x-1)(x-2) = 0$ or M1 $(x+a)(x+b) = 0$ where $ab = 2$ or $a+b = -3$ If 0 scored give M1 for $x^2 - 3x + 2 = 0$
18	(a) 4324 cao (b) (i) 4, 9 (ii) $(n+1)^2$ or $n^2 + 2n + 1$ (c) $\frac{2}{3}n(n+1)(2n+1)$ oe	2 2 1 2	M1 $\frac{1}{6} \times 23 \times 24 \times 47$ or better B1 either correct M1 recognising $V_n = 4T_n$