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

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

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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 $\dfrac{258.75}{4.6}$
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	$\dfrac{41}{333}$	3	**B2** for $\dfrac{123}{999}$ oe fraction or **M1** for 1000[x] = 123.123… 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)** ÷ 10 000 evaluated
6	135 cao	3	**M1** for 720 or (6 – 2) × 180 oe seen in working and **M1** for equation 180 + 4x = their 720 or **M1** for (360 – 180) ÷ 4 (= 45) oe seen in working and **M1** dep for 180 – 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	$y = -\dfrac{1}{2}x + 10$ oe	3	**M2** for $-\dfrac{1}{2}x + 10$ or **M1** for gradient identified as $-\dfrac{1}{2}$ or intercept as 10 (not on diagram) e.g. $y = mx + 10$ **or** $y = -\dfrac{1}{2}x + c$
9	**(a)** Correct perpendicular bisector with arcs	2	**B1** correct line **B1** correct construction arcs
	(b) 60°	1	
10	0.38 or $\dfrac{19}{50}$	4	**B1** 0.8, 0.6 or 0.55 then **M1** 0.45 × their 0.6 **M1** 0.2 × their 0.55 **or M2** 1 − (0.45 × 0.4 + 0.55 × their 0.8)
11	**(a)** $\begin{pmatrix} 8 & 5 \\ 20 & 13 \end{pmatrix}$	2	**B1** two or three entries correct
	(b) $\begin{pmatrix} 1\frac{1}{2} & -\frac{1}{2} \\ -2 & 1 \end{pmatrix}$ oe	2	**B1** $\dfrac{1}{2}\begin{pmatrix} a & c \\ b & d \end{pmatrix}$ **B1** $(k)\begin{pmatrix} 3 & -1 \\ -4 & 2 \end{pmatrix}$
12	**(a)** Negative	1	Ignore embellishments
	(b) Correct point	1	
	(c) (i) Accurate ruled line	1	
	(ii) English mark	1ft	Follow through their **(c)(i)**
13	**(a)** $\dfrac{1}{2}\mathbf{a} + \dfrac{1}{2}\mathbf{b}$ oe	2	**M1** unsimplified or any correct route e.g $\mathbf{a} + \dfrac{1}{2}(\mathbf{b} - \mathbf{a})$ or **OA + AC**
	(b) $-1\dfrac{1}{2}\mathbf{a} + 1\dfrac{1}{2}\mathbf{b}$ oe	2	**M1** unsimplified or any correct route e.g. **CD** $= 1\dfrac{1}{2}$ **AB** or $\mathbf{b} - \mathbf{a} + \dfrac{1}{2}(\mathbf{b} - \mathbf{a})$
14	**(a)** 2.84	2	**M1** correct substitution of g and ℓ seen
	(b) $\dfrac{4\pi^2\ell}{T^2}$ oe	3	**M1** each correct move but third move marked on answer line
15	**(a)** 156	4	**M1** intention to find area under graph **B2** completely correct area statement or **B1** two areas found correctly (or one trapezium area)
	(b) 12	1ft	Their **(a)**/13

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