Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

MATHEMATICS **0580/21**

Paper 2 (Extended) **May/June 2016**

MARK SCHEME

Maximum Mark: 70

Published

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Abbreviations

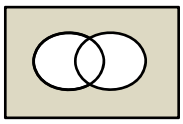
cao correct answer only
dep dependent
FT follow through after error
isw ignore subsequent working
oe or equivalent
SC Special Case
nfww not from wrong working
soi seen or implied

Question	Answer	Mark	Part marks
1	8(h) 52 (min)	**1**	
2	3.75 or 3¾	**1**	
3	[0].00127	**1**	
4	157 900 cao	**2**	**B1** for 158000 or 157860 or 157862 to 157863 If zero scored, **SC1** for *their* answer to more than 4 figs correctly rounded to 4 sf
5	393	**2**	**B1** for 393.1 to 393.2 or **M1** for 2000 ÷ 5.087
6	144	**2**	**M1** for finding a correct product of prime factors or correctly listing a minimum of 3 multiples of 36 **and** 48 or for answer $2^4 \times 3^2$ oe or $144k$
7	11	**2**	**M1** for $-2 \times -7 - 3$ soi
8	$\frac{py}{q}$ final answer	**2**	**M1** for one correct step
9	[a =] 70 [b =] 40	**2**	**B1** for each
10	28.35 cao	**2**	**B1** for 9.45 seen or **M1** for (9.4 + 0.05) × 3
11 (a)	112	**1**	
(b)	56	**1**	
12	$2p^4$ final answer	**2**	**B1** for kp^4 or $2p^k$ as answer
13	$n > 3.75$	**2**	**M1** for $7 + 8 < 5n - n$ oe
14	More than 20m from D oe Nearer to CD than to CB oe	**2**	**B1** for each

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Question	Answer	Mark	Part marks
15 (a)	-3	**1**	
(b)	$9 - 2n$ oe	**2**	**B1** for $-2n + k$ or $dn + 9$ where $d \neq 0$
16	$\frac{6}{7} \times \frac{3}{5}$ or $\frac{18}{21} \div \frac{35}{21}$ oe	**M2**	**B1** for $\frac{5}{3}$ oe or **M1** for $\frac{6}{7}$ × *their* $\frac{3}{5}$
	$\frac{18}{35}$ cao	**A1**	
17	145	**3**	**M2** for $(6 - 2) \times 180 - 5 \times 115$ or **M1** for $(6 - 2) \times 180$ Alt method **M2** for $180 - (360 - 5 \times (180 - 115))$ or **M1** for $360 - 5 \times (180 - 115)$
18	1.38 or 1.381 to 1.382	**3**	**M2** for $(36 + 4.3) \div (105 \times \frac{1000}{60 \times 60})$ oe or **M1** for $105 \times \frac{1000}{60 \times 60}$ or for a distance ÷ a speed or **SC2** for answer 1.23(4...)
19	$\frac{5}{6}$ oe	**3**	**M2** for $1 - \frac{2}{3} \times \frac{1}{4}$ or $\frac{1}{3} + \frac{2}{3} \times \frac{3}{4}$ or $\frac{1}{3} \times \frac{3}{4} + \frac{1}{3} \times \frac{1}{4} + \frac{2}{3} \times \frac{3}{4}$ or **M1** for $\frac{2}{3} \times \frac{1}{4}$ or $\frac{1}{3} \times \frac{1}{4} + \frac{2}{3} \times \frac{3}{4}$
20	27	**3**	**M2** for $\frac{6\pi}{\pi \times 2 \times 9} \times \pi \times 9^2$ oe or **M1** for $\frac{6\pi}{\pi \times 2 \times 9}$ oe
21	2	**3**	**M1** for $y = k\sqrt{x}$ **A1** for $k = 4$ or **M2** for $\frac{\sqrt{9}}{12} = \frac{\sqrt{1/4}}{y}$ oe

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Question	Answer	Mark	Part marks
22 (a)	3	**1**	
(b)	$\frac{19}{27}$ oe	**1**	
(c)	$\frac{7}{10}$ oe	**1**	
(d)		**1**	
23	69.3 or 69.28…	**4**	**M2** for height = $\sqrt{8^2 - 4^2}$ or **M1** for $4^2 + h^2 = 8^2$ oe **and M1** for $\frac{1}{2}(8+12) \times$ *their* perp height oe
24 (a)	$(a+2)(2+p)$ final answer	**2**	**B1** for $2(a+2) + p(a+2)$ or $a(2+p) + 2(2+p)$
(b)	$2(9+2t)(9-2t)$ oe	**2**	**B1** for $2(81-4t^2)$ oe or $(18+4t)(9-2t)$ oe If 0 scored **SC1** for $(9 + 2t)(9 – 2t)$ final answer
25	$y = -\frac{3}{7}x + 11$ oe	**6**	**B2** for gradient = $-\frac{3}{7}$ **or M1** for [gradient =] $\frac{15-1}{10-4}$ oe **or** for the negative reciprocal of *their* gradient **and** **B2** for [midpoint of AB =] (7, 8) or **B1** for (7, k) or (k, 8) **and M1** for substitution of *their* midpoint or (4, 1) or (10, 15) into a linear equation

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Question	Answer	Mark	Part marks
26 (a)	20.1 or 20.07 to 20.08	**2**	**M1** for $\frac{1}{2}\times 7\times 10\times \sin 35$ oe
(b)	5.86 or 5.858…..	**4**	**M2** for $7^2+10^2-2\times 7\times 10\times \cos 35$ **A1** for 34.3 .. or **M1** for $\cos 35=\frac{7^2+10^2-AC^2}{2\times 7\times 10}$

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