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MATHEMATICS **0580/22**

Paper 2 (Extended) **May/June 2017**

MARK SCHEME

Maximum Mark: 70

Published

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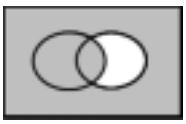
Abbreviations

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	Marks	Part Marks
1	[0].072	**1**	
2	[0].15 oe	**1**	
3	[0].62	**1**	
4	[0].394 or [0].3944 to [0].3945	**1**	
5	41.9 or 41.87	**1**	
6	$7(2x – 3y)$ final answer	**1**	
7	41	**2**	**M1** for $5(7) – 3(–2)$
8	110	**1**	
	70	**1**	
9	$\frac{5}{6} – \frac{3}{6}$ oe	**M1**	oe for $\frac{5k}{6k} – \frac{3k}{6k}$
	$\frac{1}{3}$ cao final answer	**A1**	
10	$\frac{1}{6}$ oe	**2**	**M1** for $2 – 1 = 5x + x$ oe
11(a)	6.05×10^{-2}	**1**	
11(b)	5.1×10^{3}	**1**	
12	34.8 or 34.84 to 34.85	**2**	**M1** for sin [=] $\frac{4}{7}$
13	$n < 3.5$ oe final answer	**2**	**M1** for $18 – 11 > 5n – 3n$ oe
14(a)	25	**1**	
14(b)	9	**1**	

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Question	Answer	Marks	Part Marks
15	$[\pm]\sqrt{\frac{p}{2}}$ oe	**2**	**M1** for $\frac{p}{2} = q^2$ or $\sqrt{p} = \sqrt{2}\,q$ or $[q =] \sqrt{their\ \frac{p}{2}}$ or $[q =] \frac{\sqrt{p}}{their\sqrt{2}}$
16(a)	Correct bisector with correct arcs	**2**	**B1** for correct bisector but no arcs or correct arcs but no line
16(b)	Correct region shaded	**1**	
17	4.34 or 4.336 to 4.337	**3**	**M2** for $\frac{8.15\sin 30}{\sin 110}$ or **M1** for $\frac{\sin 110}{8.15} = \frac{\sin 30}{AC}$ oe
18	2859.75 2968.75 cao final answer	**3**	**B2** for one correct seen or **B1** for 62.5 or 61.5 or 46.5 or 47.5 seen or **M1** for (62 + 0.5) × (47 + 0.5) or (62 – 0.5) × (47 – 0.5)
19	37.4 or 37.38… and 142.6 or 142.6…	**3**	**B2** for one correct or **M1** for 0.5 × 8 × 7 sin = 17 oe If zero or **M1** only scored, **SC1** for two answers with a sum of 180
20	$\frac{2x^2+x-7}{3(x+1)}$ or $\frac{2x^2+x-7}{3x+3}$ final answer	**3**	**M1** for $(2x – 1)(x + 1) – 2 \times 3$ oe with an attempt to expand the brackets **B1** for $3(x + 1)$ or $3x + 3$ for denominator
21	1.5 or $\frac{3}{2}$ or $1\frac{1}{2}$	**3**	**M1** for $\frac{k}{\sqrt{1+x}}$ **M1** for $y = \frac{their\ k}{\sqrt{1+15}}$ or **M2** for $\frac{2}{\sqrt{1+15}} = \frac{y}{\sqrt{1+8}}$
22(a)	$(3t+u)(3t-u)$ final answer	**2**	**B1** for $(at + bu)(ct + du)$ final answer where $ac = 9$ or $ad + bc = 0$ or $bd = -1$
22(b)	$(c-2d)(2-p)$ or $(p-2)(2d-c)$ final answer	**2**	**M1** for $2(c-2d) - p(c-2d)$ or $c(2-p) - 2d(2-p)$ or $p(2d-c) - 2(2d-c)$ or $2d(p-2) - c(p-2)$
23(a)(i)	24	**1**	
23(a)(ii)	5	**1**	

Question	Answer	Marks	Part Marks
23(a)(iii)	$\frac{7}{12}$	**1**	
23(b)		**1**	
24(a)	Similar	**1**	
24(b)	5.6	**2**	**M1** for $\frac{4}{8}=\frac{2.8}{AX}$ oe
24(c)	$\frac{y}{4}$ oe	**1**	
25(a)	$8x^{12}$ final answer	**2**	**B1** for $8x^k$ or kx^{12} in final answer $k \neq 0$
25(b)	9	**2**	**M1** for $27^{\frac{2}{3}}$ or 3^k or $p^{\frac{1}{2}} = 3$ or $p^3 = 729$
26	[w =] 40	**1**	
	[x =] 95	**2**	**B1** for angle ABC = 85 or *their w* + *their CBD* = 85
	[y =] 45	**2**	**B1** for angle CBD = 45 or angle ACD = 40 or angle ACD = *their w* or y = *their CBD*
27(a)	$y = 2x + 4$	**3**	**B2** for $2x + 4$ or $y = 2x + c$ or $y = mx + 4$ or **B1** for $2x + c$ or for $kx + 4$ or **M1** for rise/run
27(b)	$y = -\frac{1}{2}x + \frac{3}{2}$ oe	**4**	**B1** for (–1, 2) **M1** for the gradient $-\frac{1}{2}$ oe or $\frac{-1}{\textit{their}\ 2}$ oe **M1** for substituting *their* (–1, 2) into *their* $y = mx + c$ oe