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MATHEMATICS

0580/21

Paper 2 (Extended)

May/June 2017

MARK SCHEME

Maximum Mark: 70

Published

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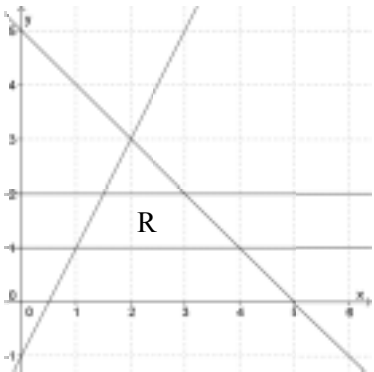
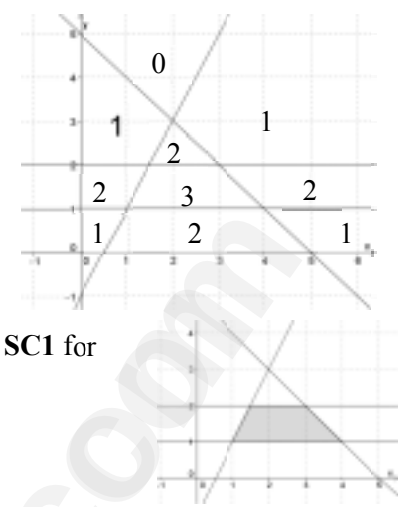
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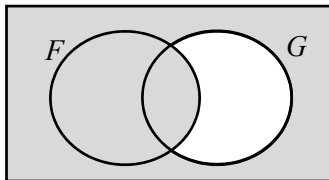
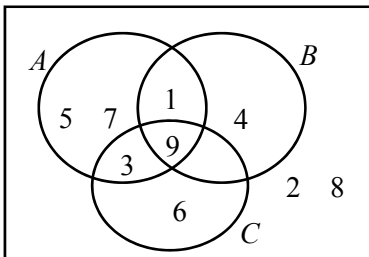
This document consists of **5** printed pages.

Abbreviations

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

Question	Answer	Mark	Part marks				
1	x^{10}	1					
2	2	1					
3(a)	23.46 cao	1					
3(b)	20 cao	1					
4(a)	Chicago	1					
4(b)	−3	1					
5	$4n(3n - m)$ final answer	2	B1 for $4(3n^2 - mn)$ or $n(12n - 4m)$ or $2n(6n - 2m)$ or $2(6n^2 - 2mn)$				
6(a)	−4	1					
6(b)	$\frac{1}{5}$ or 0.2	1					
7	$\frac{14(\text{or } 35)}{21} + \frac{15}{21}$	M1	accept $\frac{14k(\text{or } 35k)}{21k} + \frac{15k}{21k}$				
	$2\frac{8}{21}$ cao	A2	or A1 for $\frac{50}{21}$ or $1\frac{8}{21}$ or $\frac{29}{21}$ or $1\frac{29}{21}$				
8	<table border="1"><tr><td>rt</td></tr><tr><td>$(1 - t) r$</td></tr><tr><td>$(1 - r)t$ oe</td></tr><tr><td>$(1 - r)(1 - t)$ oe</td></tr></table>	rt	$(1 - t) r$	$(1 - r)t$ oe	$(1 - r)(1 - t)$ oe	3	B1 for each
rt							
$(1 - t) r$							
$(1 - r)t$ oe							
$(1 - r)(1 - t)$ oe							
9	7.65	3	M1 for $h = k\sqrt{p}$ oe M1 for $h = \text{their } k\sqrt{p}$ or M2 for $\frac{5.4}{\sqrt{1.44}} = \frac{h}{\sqrt{2.89}}$ oe				

Question	Answer	Mark	Part marks
10	Correct region identified 	3	 SC1 for
11	76.9 or 76.94 to 76.95	3	M2 for $90 \div \sqrt[3]{\frac{160}{100}}$ or $90 \times \sqrt[3]{\frac{100}{160}}$ or M1 for $\sqrt[3]{\frac{160}{100}}$ soi or $\sqrt[3]{\frac{100}{160}}$ soi or $\left(\frac{h}{90}\right)^3 = \frac{100}{160}$ oe
12	$k - 3$ or $-3 + k$	3	M1 for $5 = \frac{23-8}{k-x}$ oe M1 for $5(k-x) = 23-8$ or better e.g. $[x =] k - \frac{23-8}{5}$
13	22.6 or 22.61 to 22.62	3	M2 for $\sin [=] \frac{5}{13}$ oe or M1 for identifying angle AGE
14	165	3	M2 for $\frac{360}{8} + \frac{360}{3}$ oe or M1 for [exterior angle of octagon =] $\frac{360}{8}$ or [exterior angle of triangle =] $\frac{360}{3}$ oe
15(a)	0.8 or $\frac{4}{5}$	1	
15(b)	1180	3	M2 for $(0.5 \times 16 \times 20) + (0.5 \times 4 \times 30) + (80 \times 12)$ oe or M1 for part area
16(a)	Points plotted at (4.5, 33) and (6.5, 35)	1	

Question	Answer	Mark	Part marks										
16(b)	Positive	1											
16(c)	Correct ruled line	1											
16(d)	33.5 to 37.5	1FT	FT from <i>their</i> line providing positive gradient										
17(a)		1											
17(b)(i)		2	B1 for four out of the eight regions correct										
17(b)(ii)	Any even square number that is also a multiple of 3	1											
18(a)	$2a + b$	1											
18(b)	D	1											
18(c)	$\overrightarrow{CF}$ and $\overrightarrow{BG}$	2	B1 for each										
19	5.53 or 5.54 or 5.534 to 5.543...	4	M3 for $2 \times \left\{ \left(\frac{40}{360} \times \pi \times 10^2 \right) - \left(\frac{1}{2} \times 10^2 \times \sin 40 \right) \right\}$ or M2 for $\left[\frac{1}{2} \times \right] 10^2 \times \sin 40 \text{ and } [2 \times] \frac{40}{360} \times \pi \times 10^2$ or M1 for $\left[\frac{1}{2} \times \right] 10^2 \times \sin 40 \text{ or } [2 \times] \frac{40}{360} \times \pi \times 10^2$										
20(a)	<table border="1" data-bbox="258 1729 584 1800"><tr><td>5</td><td>7</td><td>7</td><td>8</td><td>10</td></tr><tr><td>7</td><td>9</td><td>9</td><td>10</td><td>12</td></tr></table>	5	7	7	8	10	7	9	9	10	12	1	
5	7	7	8	10									
7	9	9	10	12									
20(b)	7	1											

Question	Answer	Mark	Part marks
20(c)(i)	$\frac{7}{25}$ or 0.28 or 28%	2FT	FT $\frac{\text{their } 7}{25}$ B1 for $\frac{k}{25}$ If zero scored, then SC1 for $\frac{2}{5}$ or $\frac{6}{15}$ if no values in the bottom two rows of the table.
20(c)(ii)	0	1FT	FT $\frac{\text{their } 0}{25}$
21(a)	[u =] 35	1	
	[v =] 110	2	B1 for ACB or $ADB = 35$
21(b)	75	2	B1 for 150 or M1 for $\frac{360 - 210}{2}$
22(a)	$\frac{x}{x+3}$ final answer	3	B1 for $x(x-3)$ B1 for $(x-3)(x+3)$
22(b)	$\frac{8x+7}{(x-4)(2x+5)}$ final answer	3	B1 for common denominator of $(x-4)(2x+5)$ oe M1 for $3(2x+5) + 2(x-4)$ oe with an attempt to expand the brackets