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**MATHEMATICS**

**0580/12**

Paper 12 (Core)

**March 2017**

MARK SCHEME

Maximum Mark: 56

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**Published**

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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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	5	1	
2	2 squares added correctly	1	
3 (a)	14	1	
(b)	3000	1	
4	3600	2	M1 for $12 \times 15 \times 20$
5	35.5	2	M1 for $(34 + 38 + 10 + 87 + 45 + 28 + 19 + 23) \div 8$
6 (a)	$6.29 \times 10^5$	1	
(b)	[0].00821	1	
7	84.8 or 84.82 to 84.83[...]	2	M1 for $27 \times \pi$
8	$\frac{10 \times 20}{90 - 40}$ 4 nfww	M1 A1	
9	$5c(3c - 1)$ final answer	2	B1 for $5(3c^2 - c)$ or $c(15c - 5)$
10	9	2	M1 for $2 \times 2 \times 3 \times 3$ and $7 \times 3 \times 3$ seen or final answer 3
11 (a)	8	1	
(b)	2	1	
12	27032 cao	2	M1 for $400 \times 1.09$ [ $\times 62$ ] or $62 \times 1.09$ [ $\times 400$ ]
13	24.2 or 24.19.....	2	M1 for $\tan [=] \frac{6.2}{13.8}$
14 (a)	9	1	
(b)	Bar height 23 drawn	2	M1 for [117 -] $22 + 15 + 19 + 24 + 14$ or B1 for 94 or 23 seen

Question	Answer	Marks	Part Marks
<b>15 (a)</b>	-1	<b>1</b>	
<b>(b)</b>	25	<b>1</b>	
<b>(c)</b>	65	<b>1</b>	
<b>16 (a)</b>	Angle in semi-circle drawn with diameter through centre	<b>1</b>	
<b>(b)</b>	Equilateral triangle with correct arcs.	<b>2</b>	<b>M1</b> for clear evidence of constructed 60° angles or arcs crossing equal in length to <i>AB</i> or an accurate diagram with no/incorrect arcs
<b>17</b>	$\frac{10}{3}$ or $\frac{5}{2}$  <i>their</i> $\frac{10}{3} \times \textit{their} \frac{2}{5}$  $1\frac{1}{3}$ cao	<b>B1</b>  <b>M1</b>  <b>A1</b>	oe improper fraction  accept $\frac{20}{6} \div \frac{15}{6}$
<b>18 (a)</b>	$18w + 14$ final answer	<b>2</b>	<b>M1</b> for $20w + 12$ or $-2w + 2$ or answer $18w + k$ or $kw + 14$
<b>(b)</b>	$w^{10}$	<b>1</b>	
<b>19</b>	2981.51	<b>3</b>	<b>M2</b> for $2400 \times 1.075^3$ oe or <b>M1</b> for $2400 \times 1.075^2$ oe If zero scored <b>SC2</b> for 581.51 or <b>SC1</b> for 581.512[5] or 581.513
<b>20</b>	9	<b>3</b>	<b>B1</b> for 135°. <b>M1</b> for $\frac{\textit{their} 135}{360} \times 24$ oe
<b>21 (a)</b>	$\begin{pmatrix} 4 \\ -3 \end{pmatrix}$	<b>1</b>	
<b>(b) (i)</b>	Point at (3, 5)	<b>1</b>	
<b>(ii)</b>	$\begin{pmatrix} 1 \\ -3 \end{pmatrix}$	<b>1FT</b>	<b>FT</b> their $\overline{AC}$
<b>22 (a)</b>	2.5 or $2\frac{1}{2}$	<b>1</b>	
<b>(b)</b>	7	<b>2</b>	<b>M1</b> for $5x + 40 = [75]$ or $x + 8 = 75 \div 5$ or better
<b>(c)</b>	5	<b>1</b>	

Question	Answer	Marks	Part Marks
<b>23 (a)</b>	$[y =] -2x + 3$	<b>3</b>	<b>B2</b> for $[y =] -2x + c$ or <b>M1</b> for rise/run and <b>B1</b> for $[y =] kx + 3, k \neq 0$ or $c = 3$
<b>(b)</b>	Ruled line $y = -2x - 1$ drawn	<b>1</b>	