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**MATHEMATICS**

**0580/11**

Paper 1 (Core)

**October/November 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	Partial marks
1	101	1	
2	9944	1	
3	2	1	
4	88	2	<b>M1</b> for $\frac{68+81+74+89+x}{5} = 80$ oe or <b>B1</b> for 400
5(a)	18.8 cao	1	
5(b)	19 cao	1	
6	1.5 oe	2	<b>B1</b> for 2.25 oe
7	$3x(4x + 5y - 3)$ final answer	2	<b>B1</b> for $3(4x^2 + 5xy - 3x)$ or $x(12x + 15y - 9)$ allow in working or correct answer spoiled  If zero scored, <b>SC1</b> for $3x(4x + 5y - 3)$ with only 2 correct elements in the brackets, allow in working
8	14.25 ..... 14.35	2	<b>B1</b> for each correct or both correct but reversed
9	63.6 or 63.61 to 63.63	2	<b>M1</b> for $\pi \times 4.5^2$
10(a)	(-2, 3)	1	
10(b)	Correct rhombus with 4th point at (2,2)	1	
11(a)	$\frac{5}{9}$ cao	1	
11(b)	[0].09 then 9 [%]	2	<b>B1</b> for each

Question	Answer		Marks	Partial marks
12	$\frac{5}{3}$	$\frac{2}{3} + \frac{4}{15}$	<b>B1</b>	Allow $\frac{5k}{3k}$
	$\frac{25}{15}$ [and $\frac{11}{15}$ ]	$\frac{10}{15}$ [and $\frac{4}{15}$ ]	<b>M1</b>	Correct method to find common denominator e.g. $\frac{75}{45}$ and $\frac{33}{45}$ Follow through <i>their</i> $\frac{5}{3}$ for the <b>M1</b> mark
	$\frac{14}{15}$ cao	$\frac{14}{15}$ cao	<b>A1</b>	
13(a)	343		<b>1</b>	
13(b)	−11		<b>1</b>	
13(c)	343		<b>1</b>	
14(a)	$\begin{pmatrix} 2 \\ 7 \end{pmatrix}$		<b>1</b>	
14(b)	$\begin{pmatrix} 2 \\ 5 \end{pmatrix}$		<b>1</b>	
14(c)	$\begin{pmatrix} 8 \\ 20 \end{pmatrix}$		<b>1</b>	
15	54		<b>3</b>	<b>M2</b> for $\frac{180 \times (5-2)}{5}$ or $180 - \frac{360}{5}$ or <b>M1</b> for $180 \times (5-2)$ or $\frac{360}{5}$
16	16.1 or 16.12 to 16.13		<b>3</b>	<b>M2</b> for $\sqrt{(18^2 - 8^2)}$ or better or <b>M1</b> for $18^2 = [\dots]^2 + 8^2$ or better
17(a)	$m^{10}$ final answer		<b>1</b>	
17(b)	$20x^5y^2$ final answer		<b>2</b>	<b>B1</b> for 2 out of 3 elements correct in final answer or correct answer spoiled

Question	Answer	Marks	Partial marks
18	Correct method to eliminate one variable	<b>M1</b>	
	$[x =] -2$	<b>A1</b>	
	$[y =] 3$	<b>A1</b>	If zero scored, <b>SC1</b> for both correct but no or wrong working or <b>SC1</b> for 2 values satisfying one of the original equations
19(a)(i)	99° 63° 36°	<b>3</b>	<b>B1</b> for each  or <b>M1</b> for $162 \div 18$ or $360 \div 40$ or better  If zero scored, <b>SC1</b> for 3 angles that add to 198
19(a)(ii)	Correct labelled pie chart	<b>1FT</b>	<b>FT</b> <i>their</i> table if <i>their</i> angles add to 198
19(b)	$\frac{252}{360}$ or better fraction isw	<b>1</b>	
20(a)	71.48	<b>2</b>	<b>M1</b> for $12.8 \times 10.4$ or $9.2 \times 6.7$  or for an area of a suitable rectangle from shaded area
20(b)	132	<b>3</b>	<b>M2</b> for $2 \times (8 \times 2 + 2 \times 5 + 8 \times 5)$ oe  or <b>M1</b> for at least two of $8 \times 2$ , $8 \times 5$ and $2 \times 5$
21(a)(i)	Correct ruled bisector with two pairs of correct arcs	<b>2</b>	<b>B1</b> for correct ruled bisector missing/wrong arcs or 2 pairs of correct arcs
21(a)(ii)	Correct ruled perpendicular bisector with two pairs of correct arcs	<b>2</b>	<b>B1</b> for correct ruled bisector missing/wrong arcs or 2 pairs of correct arcs
21(b)	Correct region shaded	<b>1</b>	Dep. on at least <b>B1</b> in (a)(i) and <b>B1</b> in (a)(ii)