Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

MATHEMATICS **0580/11**

Paper 1 (Core) **October/November 2016**

MARK SCHEME

Maximum Mark: 56

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.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2016 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.

This syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

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	Thirty million[s]	**1**	
2	−7	**1**	
3	$\frac{1}{8}$ cao	**1**	
4 (a)	[0].0402	**1**	
(b)	[0].040	**1**	
5	Fully correct triangle with correct arcs	**2**	**B1** for correct triangle without arcs or for correct position of arcs If zero scored, **SC1** for fully correct reversed triangle with arcs ie $AB = 6$ cm and $AC = 7$ cm **or** for triangle with only one of AB **or** AC correct length with suitable arcs
6	$\sqrt{0.33}, 58\%, \frac{18}{31}, \frac{7}{12}, 0.59$	**2**	**B1** for 4 in correct order or **M1** for 3 of the following or better 0.583.., 0.574.., 0.58, 0.5806.. or 58.5%, 57.4%, 58.06%, 59%
7	$\begin{pmatrix} 12 \\ -16 \end{pmatrix}$	**2**	**B1** for one correct component or for $\begin{pmatrix} 10 \\ -12 \end{pmatrix}$ seen

8		$\frac{8}{12}$ and $\frac{3}{12}$ oe $\frac{5}{12}$ cao	**M1** **A1**	Correct fractions with common denominator
9		50.3 or 50.26 to 50.272	**2**	**M1** for $2 \times \pi \times 8$ oe
10		216	**2**	**M1** for $48 \div 2$ [$\times 9$]
11	**(a)**	E	**1**	
	(b)	0 or zero	**1**	
12	**(a)**	Positive	**1**	
	(b)	Zero oe	**1**	
13	**(a)**	8	**1**	
	(b)	6	**2**	**M1** for ordered list of at least the first 6 or last 6 values provided any following work is an attempt at the median
14	**(a)**	72	**1**	
	(b)	6	**1**	
	(c)	17	**1**	
15		Correctly eliminating one variable [x =] −1 and [y =] 5	**M1** **A1** **A1**	If zero scored, **SC1** for 2 values that satisfy one of the original equations **or** **SC1** if no working shown, but 2 correct answers given

16 **(a)**	Accurate arc, centre *B*, radius 5cm meeting both *BA* **and** *BC*	**1**	
(b)	Accurate bisector through angle *B* **with** 2 pairs of correct arcs **and** reaching to at least *AC*	**2**	**B1** for accurate line from *B* to at least *AC* or **M1** for correct arcs
(c)	Correct region identified 	**1**	
17	24.9 or 24.925 or 24.9[24...]	**3**	**M2** for $[x =] \frac{15}{\sin 37}$ or $[x =] \frac{15}{\cos 53}$ or **M1** for $\sin [37 =] \frac{15}{x}$ or $x \sin 37 = 15$ oe
18 **(a)**	$6n + 1$ oe final answer	**2**	**B1** for $6n + c$ or for $kn + 1$, $(k \neq 0)$
(b)	$(n + 2)^2$ final answer	**2**	**M1** for any quadratic expression or reaching second difference of 2
19 **(a)**	54	**1**	
(b)	61	**1**	
	Angle[s] [in a] triangle [add to] 180	**1**	Independent mark
(c) **(i)**	48	**1**	
(ii)	42	**1**	**FT** 90 – *their* **(c)(i)** if *their* **(c)(i)** is acute

20	**(a)**	(1, 4)	**1**	
	(b)	Point plotted at (5, −2)	**1**	
	(c)	Isosceles	**1FT**	**Strict FT** of *their* **(b)**
	(d)	$\begin{pmatrix} -4 \\ -6 \end{pmatrix}$	**1**	
	(e)	(−5, 3)	**1**	
21	**(a)**	2	**2**	**M1** for one correct step e.g. $4x = 11 - 3$ or $x + \frac{3}{4} = \frac{11}{4}$ or better
	(b)	$[x =] \sqrt{\frac{y+2}{4}}$ or $\sqrt{(y+2)/4}$ or $\frac{\sqrt{y+2}}{2}$ oe final answer	**3**	**M1** for one correct step e.g. $y + 2 = 4x^2$ or $\frac{y}{4} = x^2 - \frac{2}{4}$ **M1** for a further correct step e.g. $\frac{y+2}{4} = x^2$ or $\frac{y}{4} + \frac{2}{4} = x^2$