Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

MATHEMATICS **0580/13**

Paper 1 (Core) **May/June 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.

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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	Mark	Part marks
1	9 082 507	**1**	
2	71 000 cao	**1**	
3	17	**1**	
4	Negative	**1**	
5	1.72	**1**	
6 (a)	2 −6 −8	**1**	
(b)	3 −8	**1**	
7	0.5 or $\frac{1}{2}$	**2**	**M1** for correct first step e.g. $6y + 6 = 9$ or $y + 1 = \frac{9}{6}$
8 (a)	$\begin{pmatrix} -6 \\ 3 \end{pmatrix}$	**1**	
(b)	Point B at $(-3, 2)$	**1**	
9	10.3 oe	**2**	**M1** for $5x = 51.5$ oe
10	4.95 5.05	**1, 1**	**SC1** for both correct but reversed
11	$\frac{1}{12} \times \frac{6}{5}$ oe	**M1**	Must be shown
	$\frac{1}{10}$ final answer cao	**A1**	
12	22.1	**2**	**M1** for $\cos 16 = \frac{AC}{23}$ soi
13	128	**3**	**M1** for 800 ÷ 6.24 **A1** for 128.2 .....

Question	Answer	Mark	Part marks
14	4 990 or 4 989 or 4 989.2 or 4 989.23	**3**	**M2** for $4\,500\left(1+\frac{3.5}{100}\right)^3$ oe or **M1** for $4\,500\left(1+\frac{3.5}{100}\right)^2$ oe
15 (a)	72	**1**	
(b)	123	**2FT**	FT dep. on answer being obtuse **M1** for (360 – *their*(a) – 42) [÷2]
16	For correctly eliminating one variable	**M1**	Or correctly rearranging one equation and substituting into the other
	[x =] 3.5	**A1**	
	[y =] −4.5	**A1**	
			If zero scored **SC1** for 2 values satisfying one of the original equations or if no working shown but 2 correct answers given
17 (a)	$\frac{24}{100}$ oe	**1**	
(b)	$\frac{78}{100}$ oe	**2**	**M1** for $\frac{18+36+24}{100}$ or $1-\frac{22}{100}$
(c)	0	**1**	
18 (a)	2 cao	**2**	**M1** for rise/run attempted e.g. 4/2 or other correct method for finding gradient or **SC1** for $y = 2x - 1$ as answer
(b)	$y = 2x + 6$ oe	**2FT**	**FT** for $y =$ *their(a)*$x + 6$ **B1** for $y = mx + 6$ ($m \neq 0$ or 2) or $y = 2x$ [+ k] or $y =$ *their(a)*x [+ k] ($k \neq 6$) or for answer $2x + 6$ or answer *their(a)*$x + 6$
19 (a)	44	**3**	**M2** for $\sqrt{93.5^2 - 82.5^2}$ or **M1** for $CD^2 + 82.5^2 = 93.5^2$
(b)	33	**1FT**	**FT** 93.5 – (82.5 + *their* (a))
20 (a) (i)	2400	**1**	
(ii)	Ruled line (08 15, 0) to (08 45, *their* 2400)	**1FT**	Follow through *their* 2400 and 30 minute time period

Question	Answer	Mark	Part marks
(b) (i)	Horizontal line 1.5 hours from (*their* 08 45, *their* 2400)	**1FT**	**FT** (*their* 08 45 + 90 min, *their* 2400)
	Line from *their* (10 15, 2400) to Home axis 15 min later	**1FT**	**FT** (*their* 10 15, *their* 2400) to (*their* 10 15 + 15 min, 0)
(ii)	160	**2FT**	**M1FT** for *their* 2400 ÷ 15
21 (a) (i)	120	**1**	
(ii)	15	**2**	**M1** for *their* 120 ÷ 360 [× 45] or 45 ÷ 360 [× *their* 120]
(b)	192	**2**	**M1** for 24 ÷ 45 [× 360]
(c)	Line giving angles of 192° and 48° from given lines	**1FT**	**FT** *their* 192
(d)	Blue and an acceptable reason	**1**	