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 $\cos 16 = \dfrac{AC}{23}$ soi
13		128	**3**	**M1** for $800 \div 6.24$ **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 $4\,500\left(1+\dfrac{3.5}{100}\right)^{3}$ oe or **M1** for $4\,500\left(1+\dfrac{3.5}{100}\right)^{2}$ 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 [$x =$] 3.5 [$y =$] −4.5	M1 A1 A1	Or correctly rearranging one equation and substituting into the other 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)	$\dfrac{24}{100}$ oe	1	
(b)	$\dfrac{78}{100}$ oe	2	**M1** for $\dfrac{18+36+24}{100}$ or $1-\dfrac{22}{100}$
(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**	