



**Cambridge International Examinations**  
Cambridge International General Certificate of Secondary Education

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**MATHEMATICS**

**0580/13**

Paper 1 (Core)

**May/June 2016**

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.

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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

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

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Question	Answer	Mark	Part marks
14	4990 or 4989 or 4989.2 or 4989.23	3	M2 for $4500\left(1 + \frac{3.5}{100}\right)^3$ oe or M1 for $4500\left(1 + \frac{3.5}{100}\right)^2$ oe
15 (a)	72	1	
(b)	123	2FT	FT dep. on answer being obtuse M1 for $(360 - \text{their}(a) - 42) [\div 2]$
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)	$\frac{24}{100}$ 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 $y = \text{their}(a)x + 6$ B1 for $y = mx + 6$ ( $m \neq 0$ or 2) or $y = 2x [+ k]$ or $y = \text{their}(a)x [+ k]$ ( $k \neq 6$ ) or for answer $2x + 6$ or answer $\text{their}(a)x + 6$
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 $93.5 - (82.5 + \text{their}(a))$
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

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