

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

Cambridge International General Certificate of Secondary Education

## **MARK SCHEME for the May/June 2015 series**

### **0580 MATHEMATICS**

**0580/33**

Paper 3 (Core), maximum raw mark 104

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
nfw	not from wrong working
soi	seen or implied

Question	Answer	Mark	Part marks
1 (a) (i)	2, 1, 3, 5, 4, 3, 2	2	M1 for 4 correct frequencies or all tallies correct and frequency column blank or for all frequencies correct in tally column
(ii)	13	1	
(iii)	13.25	2	M1FT for attempt at <i>their</i> $\Sigma(xf) \div 20$
(iv)	23 50 cao	1	
(b) (i)	16	1	
(ii)	6	1	
(iii)	one correct comment	1	examples; Mode for Sparke(16) greater than mode for Pherlak(13) ; the range is the same for both; the mean is the same for both [13.25]; the total [number of trains] is the same [265]; median for Sparke(13.5) greater than median for Pherlak(13)
2 (a)	equilateral isosceles right-angled or scalene	3	B1 for each
(b) (i)	40	1	
(ii)	86 cm <sup>2</sup>	2 1	M1 for $8 \times 12 - 2 \times 5$ oe B1indep for cm <sup>2</sup>
(c) (i)	angle [in a] semi-circle [=90]	1	accept any correct equivalent statement
(ii)	14.8	3	M2 for $\sqrt{16^2 - 6^2}$ oe or better or M1 for $AC^2 + 6^2 = 16^2$ or better
(iii)	56.0 to 56.144	5	M2 for $\pi \times 8^2 \div 2$ oe or M1 for $\pi \times 8^2$  M1 for $6 \times \textit{their (c)(ii)} \div 2$ oe or 44.4[...]  M1dep for the area of <i>their</i> semi-circle – the area of <i>their</i> triangle

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<b>Question</b>	<b>Answer</b>	<b>Mark</b>	<b>Part marks</b>
<b>3</b>	<b>(a) (i)</b> 76, 124	<b>2</b>	<b>B1</b> for each or <b>SC1</b> for two angles adding to 200
	<b>(ii)</b> pie chart with two correct sectors	<b>1</b>	<b>FT</b> their table providing two angles adding to 200
	<b>(b)</b> $\frac{4}{15}$ final answer <b>cao</b>	<b>2</b>	<b>M1</b> for $\frac{96}{360}$ or $\frac{24}{90}$ isw oe
	<b>(c)</b> 72	<b>2</b>	<b>M1</b> for $\frac{405 \times 64}{360}$ or $\frac{405 \times 16}{90}$ oe
<b>4</b>	<b>(a)</b> lines <i>AC</i> and <i>BC</i> correct and with correct arcs	<b>2</b>	<b>B1</b> for one of their lines the correct length or correct triangle no arcs
	<b>(b)</b> correct bisector with two pairs of correct arcs	<b>2FT</b>	<b>M1FT</b> for correct line without arcs or two pairs of correct arcs
	<b>(c)</b> 5.9 to 6.3	<b>1FT</b>	
	<b>(d)</b> 119 to 123	<b>1FT</b>	
<b>5</b>	<b>(a)</b> 47 200	<b>3</b>	<b>M2</b> for $40\,000 + \frac{40\,000 \times 3.6 \times 5}{100}$ or <b>M1</b> for $\frac{40\,000 \times 3.6 \times 5}{100}$ or 7200
	<b>(b)</b> 443.8[0] <b>cao</b>	<b>1</b>	
	<b>(c)</b> 142	<b>3</b>	<b>M2</b> for $24 \times 1.25 + 32 \times 3.5$ or $30 + 112$ or <b>M1</b> for either $24 \times 1.25$ or $32 \times 3.5$ or 30 or 112
	<b>(d)</b> 45 30 105	<b>3</b>	<b>M2</b> for $3$ (or $2$ or $7$ ) $\times \frac{180}{3+2+7}$ or better or <b>M1</b> for $\frac{180}{3+2+7}$ or better  If zero scored <b>SC2</b> for the correct answers in the incorrect places
	<b>(e)</b> 52.5	<b>2</b>	<b>M1</b> for 2 of 8[h] 45[m], 9[h] 30[m] and 8[h] oe
	<b>(f)</b> $8 \times 20 = 160$	<b>2</b>	<b>B1</b> for 8 or 20 seen

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Question	Answer	Mark	Part marks	
6	(a)	09 20	1	
	(b)	10 00	1	
	(c)	20	1	
	(d)	50	3	M1 for use of $125 \div \textit{their time}$ B1 for time = 2.5
	(e) (i)	points (09 50, 125) and (11 40, 0) plotted and joined with a ruled continuous line	1	
	(ii)	10 40 to 10 50	1FT	FT <i>their</i> line
(f)	56.28 final answer cao	1		
7	(a)	-1	1	
	(b) (i)	16....-2....-2....16	2	B1 for 2 correct
	(ii)	10 points correctly plotted Correct smooth curve	4	B3FT for 9 or 10 points correctly plotted B2FT for 7 or 8 points correctly plotted B1FT for 5 or 6 points correctly plotted
	(iii)	Strict FT their intersection	2FT	B1 for one correct value
8	(a) (i)	394.1 cao	2	M1 for 394[. ...] or $4 \times \pi \times 5.6^2$
	(ii)	$7a - 4b$ final answer	2	B1 for either $7a$ or $-4b$ in their final answer
	(iii)	18	1	
	(iv)	11	1	
	(b)	$[x =] 5$ $[y =] -2$ Working must be shown	4	M1 for correctly equating one set of coefficients M1 for correct method to eliminate one variable A1 for $[x =] 5$ A1 for $[y =] -2$ If zero scored SC1 for 2 values satisfying one of the original equations SC1 if no working shown but 2 correct answers

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Question	Answer	Mark	Part marks	
9	(a) (i)	17	1	
	(ii)	add 3 or +3	1	
	(iii)	$3n + 2$ oe as final answer	2	<b>B1</b> for $3n + k$ or $jn + 2$ ( $j \neq 0$ )
	(iv)	300 is in the 3 times table [and all the terms are 1 less or 2 more than the 3 times table]	1	accept any correct reason
	(b) (i)	22 29	2	<b>B1</b> for either correct or <b>SC1</b> for a difference between the two terms of 7
	(ii)	the difference increases by one each time	1	accept any correct explanation
10	(a)	three correct points	2	<b>B1</b> for two correct points
	(b)	correct ruled continuous line of best fit	1	
	(c)	negative	1	
	(d)	2.25 to 2.30	1	<b>FT</b> <i>their</i> straight line of best fit if negative
	(e)	460 to 560	1	<b>FT</b> <i>their</i> straight line of best fit if negative
11	(a)	correct reflection, points at (1, -4), (4, -4) and (1, -5)	2	<b>B1</b> for reflection in $y = k$
	(b)	correct translation, points at (-4, 2), (-1, 2) and (-4, 3)	2	<b>B1</b> for translation $\begin{pmatrix} -5 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ 4 \end{pmatrix}$
	(c) (i)	rotation [centre] (0, 0) oe 90° (anti-clockwise) oe	3	<b>B1</b> for each part
	(ii)	enlargement [centre] (-4, -1) [sf] 2	3	<b>B1</b> for each part