CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 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.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2015 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.

® IGCSE is the registered trademark of Cambridge International Examinations.

CAMBRIDGE
International Examinations

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 (a)	9 hours 5 minutes	**2**	**B1** for 17 hrs 5 mins or using 1030 or 1135
(b) (i)	12034	**3**	**M2** for $290 \times 37 + 163 \times 8$ or **M1** for either 290×37 or 163×8
(ii)	84.9	**2**	**M1** for $(37 + 8) \div 53$ or better
(iii)	9628	**1**	
(c)	100.5 101.5	**1** **1**	**SC1** for correct but reversed
(d) (i)	Copenhagen 3 Helsinki 5 St Petersburg 10 Stockholm 4 Tallinn 8	**2**	**B1** for 3 or 4 correct or fully correct tallies if frequency column blank or correct frequencies in tally column
(ii)	Correct bar chart	**3FT**	**B3** All bars correct height same width and same gaps between bars and linear scale **B2** for all bars correct height same width and same gaps between bars **B1** for linear scale on *y*-axis **B1 FT** 3 or 4 correct heights
2 (a)	4800 7200 9600	**3**	**M2** for 1 correct value in correct place **M1** for $21600 \div (2 + 3 + 4)$ or better If zero scored **SC1** for all correct values in incorrect order
(b) (i)	4200	**2**	**M1** for 0.3×14000 oe
(ii)	$\frac{4}{7}$ cao	**2**	**B1** for correct fraction other than $\frac{8000}{14000}$
(iii)	1200	**2 FT**	**M1FT** for (14000 – *their* **(b)(i)** – 8000 – 600)

© Cambridge International Examinations 2015

Question	Answer	Mark	Part marks
(c)	20	**3**	**M2** for $(1 - 17280 \div 21600) \times 100$ oe or **M1** for $(17280 \div 21600) \times 100$ oe Alternative method **M2** for $\frac{21600 - 17280}{21600} \times 100$ or **B1** for $21600 - 17280$ soi 4320
(d)	422.9[0] or 422.89	**3**	**M2** for 5500×1.025^3 [– 5500] oe **M1** for 5500×1.025^2 oe
3 (a) (i)	4 points correctly plotted	**2**	**B1** for 3 points correctly plotted
(ii)	Correct ruled line of best fit	**1**	
(iii)	Negative	**1**	
(b) (i)	73	**1**	
(ii)	50 to 56	**1FT**	**FT** *their* straight line of best fit if negative and *their* **(b)(i)**
4 (a) (i)	11	**1**	
(ii)	17	**3**	**M1** for $8y + 28 = 164$ or $2y + 7 = 41$ **M1 FT** for a correct further step
(b)	$48x^5$	**2**	**M1** for $48x^k$ or jx^5
(c) (i)	9	**1**	Accept ± 9
(ii)	343	**1**	
(iii)	1	**1**	
(d) (i)	6800	**1**	
(ii)	$\frac{1}{4}$	**1**	Accept equivalent fraction
(iii)	6	**1**	
(iv)	6.87×10^8	**1**	
5 (a) (i)	Radius	**1**	
(ii)	Chord	**1**	

© Cambridge International Examinations 2015

Question	Answer	Mark	Part marks
(b) (i)	90	1	
	Angle [in a] semi-circle	1	
(ii)	25	1	
	Angles [in a] triangle [add to] 180°	1	
(iii)	65	1FT	
	Angle [between] radius and tangent is 90° oe	1	
(iv)	65	1FT	
	Alternate angles	1	
6 (a) (i)	Blue	1	
(ii)	$\frac{2}{16}$ oe	1	
(b) (i)	4.52 or 4.523 to 4.524…	3	**M2** for $1.5^2\pi - 0.9^2\pi$ or better or **M1** for either $1.5^2\pi$ or $0.9^2\pi$ or better
(ii)	9.42 or 9.43 or 9.424 to 9.426	2	**M1** for $2 \times 1.5\pi$ or better
(iii)	2.6[0]	2	**M1** for $20 - (12 \times 1.45)$
7 (a) (i)	8	1	
(ii)	6	2FT	**M1** for $\frac{their 8 \times 15}{20}$ or $\frac{2}{5} \times 15$ oe
(b) (i)	30 or 29.6 to 30.4	1	
(ii)	Arc 7 cm from *B*	1	Arcs must be continuous lines and fit for purpose (intersect twice)
	Arc 6 cm from *C*	1	If 0, 0 scored then **SC1** for two correct arcs that intersect once
	Correct area shaded	1 dep	Dependent on an attempt at 2 arcs
(iii)	6500	1	

© Cambridge International Examinations 2015

8	**(a)**	$5x + 3$	**3**	**B2** for $5x + c$ or $kx + 3$ k not equal 0 or **M1** for attempt at $\frac{Rise}{Run}$
	(b) (i)	10, 3, −5	**3**	**B1** for each correct
	(ii)	Correct curve	**4**	**B3FT** for 7 or 8 points correctly plotted **B2FT** for 5 or 6 points correctly plotted **B1FT** for 3 or 4 points correctly plotted
	(iii)	−0.5 to – 0.4 and 4.4 to 4.5	**2FT**	**B1FT** for each correct
9	**(a) (i)**	Correct rotation	**2**	**B1** for correct rotation with incorrect centre used
	(ii)	Correct reflection	**2**	**B1** for reflection in $x = k$ or $y = -1$
	(iii)	Enlargement [Scale factor] 0.5 oe [Centre] (7, 4)	**1** **1** **1**	
	(b) (i)	(5, −2)	**1**	
	(ii)	$\begin{pmatrix} -3 \\ -5 \end{pmatrix}$	**1**	
	(iii)	Z plotted at (3,4)	**1**	
10	**(a)**	15 20 16 21	**2**	**B1** for 1 correct row or column
	(b) (i)	$5n$ oe final answer	**1**	
	(ii)	$5n + 1$ oe final answer	**1 FT**	**FT** algebraic expression
	(c)	100	**1**	
		101	**1**	

© Cambridge International Examinations 2015