

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

Cambridge International General Certificate of Secondary Education

## **MARK SCHEME for the October/November 2015 series**

### **0580 MATHEMATICS**

**0580/32**

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<sup>®</sup>, Cambridge International A and AS Level components and some Cambridge O Level components.

© IGCSE is the registered trademark of Cambridge International Examinations.

<b>Page 2</b>	<b>Mark Scheme</b>	<b>Syllabus</b>	<b>Paper</b>
	<b>Cambridge IGCSE – October/November 2015</b>	<b>0580</b>	<b>32</b>

### 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
<b>1 (a)</b>	21 000 000	<b>1</b>	
<b>(b)</b>	1, 3, 7, 21	<b>2</b>	<b>M1</b> for 3 correct and one incorrect (or missing) or for 4 correct and one extra  If zero scored <b>SC1</b> for any <b>two</b> other prime numbers greater than 21
<b>(c)</b>	$\frac{21}{100}$	<b>1</b>	
<b>(d)</b>	$(210 + 21) \div (2.1 + 21)$	<b>1</b>	
<b>(e)</b>	23 29	<b>1</b> <b>1</b>	
<b>(f)</b>	2100	<b>1</b>	
<b>(g)</b>	436 or 436.4...	<b>1</b>	
<b>(h)</b>	21	<b>1</b>	
<b>(i)</b>	1	<b>1</b>	
<b>(j)</b>	$2.1 \times 10^{-3}$	<b>1</b>	
<b>(k)</b>	105	<b>2</b>	

Page 3	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2015	0580	32

2	(a)	<table border="1"> <tr><td>O</td><td>X</td><td>X</td><td>X</td><td>X</td></tr> <tr><td>O</td><td>O</td><td>X</td><td>X</td><td>X</td></tr> <tr><td>O</td><td>O</td><td>O</td><td>X</td><td>X</td></tr> <tr><td>O</td><td>O</td><td>O</td><td>O</td><td>X</td></tr> <tr><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td></tr> </table>	O	X	X	X	X	O	O	X	X	X	O	O	O	X	X	O	O	O	O	X	O	O	O	O	O	1	
	O	X	X	X	X																								
	O	O	X	X	X																								
	O	O	O	X	X																								
	O	O	O	O	X																								
O	O	O	O	O																									
(b)	10, 6, 16 15, 10, 25	2	M1 for 4 or 5 correct numbers or for one correct row																										
(c)	$n^2$	1																											
(d)	529	1FT	FT <i>their</i> (c) if algebraic expression																										
(e)	Add on 2, then 3, then 4 etc. oe	1																											
3	(a) (i)	Correct net	1																										
	(ii)	132	2	M1 for $(2 \times 5 + 2 \times 8 + 5 \times 8) \times 2$ oe or SC1 for correct area of <i>their</i> net, if it has 6 rectangles																									
	(iii)	80 cm <sup>3</sup>	2 1	M1 for $8 \times 5 \times 2$																									
	(b)	3, 4, 5	2	M1 for any 3 integers with a product of 60 or M1 for any 3 numbers with a product of 60, satisfying 2 of the conditions																									
4	(a)	132	1																										
	(b)	124	2	M1 for $180 - 155$ soi by 25 or for $360 - 120 - 91 - \textit{their}$ angle marked on diagram provided <i>their</i> angle is less than 149																									
	(c) (i)	Isosceles	1																										
	(ii)	68	1																										
	(iii)	127	1FT	FT is $360 - 165 - \textit{their}$ (c)(ii) or $195 - \textit{their}$ (c)(ii)																									
	(d) (i)	28	2	M1 for 90 marked at A or for $180 - (90 + 62)$ or $90 + 62$ or $90 - 62$																									
(ii)	Chord	1																											

Page 4	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2015	0580	32

5	(a) (i)	55	1	
		Tennis	1	
	Hockey	1		
	Gymnastics , Hockey	1		
	(ii)	30	3	
	(b) (i)	$\frac{7}{10}$ oe	1	
(ii)	4 points correctly plotted	2	B1 for 3 correct points	
(iii)	No [because] no correlation oe	1		
6	(a) (i)	60, 24, 96	3	M2 for $\frac{180}{(5+2+8)} \times k$ where $k$ is 5, 2 or 8 or better or M1 for $\frac{180}{(5+2+8)}$ or better If zero scored SC1 for all correct answers in incorrect order
		(ii)	74.5 75.5	1 1
	(b) (i)	65	1	
		(ii)	780	2
	(iii)	324	2	M1 for $240 \times 1.35$ oe
	(c)	$\frac{7k}{40k}$	2	M1 for $\left(1 - \frac{3}{10}\right) \div 4$ oe

Page 5	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2015	0580	32

	(d) (i) 470 (ii) $4m + 3t = 370$ (iii) Correct working and [m] 40 [t] 70	1 2 4	<b>B1</b> for $4m + 3t$ seen <b>M1FT</b> for correctly equating one set of coefficients <b>M1FT</b> for correct method to eliminate one variable <b>A1</b> for $m = 40$ <b>A1</b> for $t = 70$ If zero scored <b>SC1</b> for either: 2 correct answers given or 2 values satisfying one of their original equations
7	(a) (i) 10 (ii) 48  (b) (i) Straight line (0920, 16) to (0924, 16)  Straight line from (their 0924, 16) to (their 0924 + 12, 0) (ii) 22.2 or 22.22...  (c) 1245 [pm]	1 3  1  1FT 2  2	<b>M2</b> for $\frac{16}{20} \times 60$ oe or <b>M1</b> for $\frac{16}{20}$ oe  If zero scored <b>SC1</b> for $\frac{16}{18} \times 60$ or 53.3...  <b>M1</b> for $\frac{80 \times 1000}{60 \times 60}$ oe  If zero scored <b>SC1</b> for $\frac{\text{figs } 8}{\text{figs } 36}$ or figs 222  <b>M1</b> for $3 \times 75$ soi or <b>SC1</b> for answer 1400 or 2 pm
8	(a) (i) Enlargement [Centre] (1, 8) [Scale factor] 3  (ii) Rotation [Centre] (0, 0) oe 180°  (iii) Translation $\begin{pmatrix} -5 \\ -2 \end{pmatrix}$	1 1 1  1 1 1  1 1	

<b>Page 6</b>	<b>Mark Scheme</b>	<b>Syllabus</b>	<b>Paper</b>
	<b>Cambridge IGCSE – October/November 2015</b>	<b>0580</b>	<b>32</b>

	<b>(b)</b>	Correct reflection drawn	<b>2</b>	<b>B1</b> for reflection in $x = k$ If zero scored <b>SC1</b> for reflection in $y = 5$
<b>9</b>	<b>(a)</b>	$[y = ]2x + 4$	<b>3</b>	<b>B2</b> for $2x + c$ or $kx + 4$ $k \neq 0$ or <b>M1</b> for gradient $= \pm \frac{2k}{k}$ or attempt at $\frac{\text{rise}}{\text{run}}$ using a triangle or co-ordinates allowing one slip
	<b>(b)</b>	$-0.5, -1, -2, -8, 8, 2, 1, 0.5$	<b>3</b>	<b>B2</b> for any 6 or 7 correct or <b>B1</b> for any 4 or 5 correct
	<b>(c)</b>	Correct curve	<b>4</b>	<b>B3FT</b> for 11 or 12 points correctly plotted <b>B2FT</b> for 9 or 10 points correctly plotted <b>B1FT</b> for 7 or 8 points correctly plotted
<b>10</b>	<b>(a)</b>	<b>(i)</b> Correct ruled perpendicular bisector drawn with 2 pairs of arcs	<b>2</b>	<b>B1</b> for correct ruled line drawn with some or no or incorrect arcs or <b>B1</b> for 2 correct pairs of arcs
		<b>(ii)</b> Correct ruled angle bisector drawn with 2 pairs of arcs	<b>2</b>	<b>B1</b> for correct ruled line drawn with some or no or incorrect arcs or <b>B1</b> for 2 correct pairs of arcs
	<b>(b)</b>	Arc 5 cm from $D$	<b>1</b>	Arcs must be continuous and fit for purpose  If 0, 0 scored, <b>SC1</b> for either 5 cm arc from $D$ at least touching $DC$ and $DE$ or for 4 cm arc from $C$ at least touching $DC$ and $BC$
		Arc 4 cm from $C$	<b>1</b>	
		Correct region shaded	<b>1FT</b>	<b>1FT</b> dep on an attempt to draw 2 arcs