

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

Cambridge International General Certificate of Secondary Education

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

### **0580 MATHEMATICS**

**0580/31**

Paper 3 (Core), maximum raw mark 104

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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									
<b>1 (a) (i)</b>	<table border="1"> <tr> <td>26</td> <td>39</td> <td>65</td> </tr> <tr> <td>44</td> <td>11</td> <td>55</td> </tr> <tr> <td>70</td> <td>50</td> <td>120</td> </tr> </table>	26	39	65	44	11	55	70	50	120	<b>2</b>	<b>B1</b> for 3 or 4 correct
	26	39	65									
	44	11	55									
	70	50	120									
	<b>(ii)</b> $\frac{11}{30}$ cao	<b>2</b>	<b>B1</b> for $\frac{44}{120}$ or $\frac{22}{60}$									
	<b>(iii)</b> 2 : 3 cao	<b>2</b>	<b>B1FT</b> for $2k : 3k$ where $k$ is an integer or <i>their</i> 26 : <i>their</i> 39 or better with integer values									
<b>(b) (i)</b> 7.53	<b>2</b>	<b>M1</b> for attempt at ordered list, or 7.34 and 7.72 identified										
<b>(ii)</b> 3.65	<b>1</b>											
<b>(iii)</b> 10.06    6.01	<b>2</b>	<b>B1</b> for 1 correct										
<b>2 (a) (i)</b>	24 or 30	<b>1</b>										
	<b>(ii)</b> 25	<b>1</b>										
	<b>(iii)</b> 27	<b>1</b>										
	<b>(iv)</b> 23 or 29	<b>1</b>										
	<b>(b) (i)</b> 17	<b>1</b>										
	<b>(ii)</b> 243	<b>1</b>										
	<b>(iii)</b> 1	<b>1</b>										

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<b>Question</b>	<b>Answer</b>	<b>Mark</b>	<b>Part marks</b>
(iv)	$0.0625$ or $\frac{1}{16}$	<b>1</b>	
(c) (i)	$2^2 \times 3 \times 7$ or $2 \times 2 \times 3 \times 7$	<b>2</b>	<b>B1</b> for 2, 2, 3, 7
(ii)	42	<b>2</b>	<b>B1</b> for $2 \times 3 \times 7$ or 2 or 3 or 6 or 7 or 14 or 21 as answer or [126 = ] $2 \times 3^2 \times 7$ or $2 \times 3 \times 3 \times 7$
<b>3</b> (a) (i)	565.25	<b>2</b>	<b>M1</b> for $\left(1 - \frac{5}{100}\right) \times 595$ oe
(ii)	42.75	<b>2FT</b>	<b>2FT</b> if positive difference (ie (a)(i) < 608) <b>M1</b> for $38 \times 16$ (or 608) – <i>their</i> (a)(i)
(b)	9.2[0...]	<b>2</b>	<b>M1</b> for $\left(\frac{26272 - 23854}{26272}\right) \times 100$ oe or $\left(1 - \frac{23854}{26272}\right) \times 100$ oe or $100 - \frac{23854}{26272} \times 100$ oe
(c)	$5.07 \times 10^5$ cao	<b>2</b>	<b>B1</b> for figs 507 or for $a \times 10^5$ ( $a \neq 0$ )
(d) (i)	120° 80°	<b>3</b>	<b>B2</b> for one correct or <b>M1</b> for $\frac{15}{45} \times 360$ or $\frac{10}{45} \times 360$ or $\frac{160}{20} \times 15$ or $\frac{160}{20} \times 10$ or better
(ii)	Pie chart correct	<b>1FT</b>	<b>FT</b> if <i>their</i> angles add to 200°
(e)	$3.84 \times 10^6$	<b>2</b>	<b>B1</b> for answer figs 384

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Question	Answer	Mark	Part marks
4	(a) (i) $m + 5$	1	
	(ii) $2m$	1	
	(iii) $m + m + 5 + 2m = 47$ isw	1FT	FT $m + their (a)(i) + their (a)(ii) = 47$ isw or $4m + 5 = 47$ isw
	(iv) 10.5 15.5 21	3	M1FT for correct first step to solve <i>their (a)(iii)</i> A1FT for $m = 10.5$
	(b) (i) Yes, [total = ] 114.5 [cm]	2	M1 for $55 + 39.5 + 20$ oe or for 1145 mm
	(ii) 5.5	1	
	(c) (i) 102	1	
	(ii) 37.5[0]	2	M1 for $25.5[0] \div 0.68$

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Question	Answer	Mark	Part marks
5	(a) (i) 4.8	2	<b>B1</b> for 9.6 seen
	(ii) 137	1	
	(b) Correct length and bearing	2	<b>B1</b> for $AC = 6.4$ cm <b>B1</b> for correct bearing $310^\circ$
	(c) Perpendicular bisector with 2 sets of correct arcs	2	<b>B1</b> for correct line with some or no or incorrect arcs or <b>B1</b> for 2 sets of correct arcs
	(d) Correct area shaded	3	<b>B2</b> for arc centre $B$ radius 6 cm touching <i>their</i> bisector twice  or <b>B1</b> for arc centre $B$ , with radius 6 cm but incorrect length or for arc centre $B$ , with incorrect radius
(e) 11 03	3	<b>M2</b> for $12 \div 15 \times 60$ or <b>M1</b> for $12 \div 15$ soi  If zero scored, <b>SC1</b> for <i>their</i> time added to 10 15 correctly	
6	(a) Cylinder	1	
	(b) Cube or cuboid	1	
	(c) (i) $\sqrt{6^2 - 3^2}$ 5.19...	<b>M2</b> <b>A1</b>	<b>M1</b> for $6^2 = 3^2 + BC^2$ or $(BC^2 = ) 6^2 - 3^2$
	(ii) 7.79 to 7.8	2	<b>M1</b> for $0.5 \times 5.2 \times 3$
	(iii) 62.4	1FT	<b>FT</b> $8 \times$ <i>their</i> (c)(ii)
	(d) (i) 28	2	<b>M1</b> for $0.5 \times (6 + 8) \times 4$ oe
(ii) 12	1FT	<b>FT</b> $336 \div$ <i>their</i> (d)(i)	

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<b>Question</b>	<b>Answer</b>	<b>Mark</b>	<b>Part marks</b>
<b>7</b>	<b>(a) (i)</b> -2, -3, -6, 3	<b>2</b>	<b>B1</b> for 2 or 3 correct
	<b>(ii)</b> Correct curves	<b>4</b>	<b>B3FT</b> for 9 or 10 correctly plotted points or <b>B2FT</b> for 7 or 8 correctly plotted points or <b>B1FT</b> for 5 or 6 correctly plotted points
	<b>(iii)</b> Ruled line $y = 4$	<b>1</b>	
	<b>(iv)</b> (1.4 to 1.6, 4)	<b>1</b>	<b>SC1</b> for (4, 1.4 to 1.6) from line $x = 4$ drawn
	<b>(b) (i)</b> (-1, -3) plotted	<b>1</b>	
	<b>(ii)</b> Correct ruled line	<b>1FT</b>	<b>FT</b> line with gradient 2 through <i>their A</i>
	<b>(iii)</b> $2x - 1$	<b>2FT</b>	<b>FT</b> $2x + \textit{their}$ $y$ -intercept for 2 marks <b>B1</b> for $2x + k$ or $mx - 1$ ( $m \neq 0$ ) or $mx + \textit{their}$ $y$ -intercept ( $m \neq 0$ )

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Question	Answer	Mark	Part marks
8	(a) (i) 2	1	
	(ii) Two correct lines of symmetry drawn	2	<b>B1</b> for one correct line
	(b) (i) Correct reflection	2	<b>B1</b> for reflection in $x = k$ or $y = -1$
	(ii) Correct enlargement	2	<b>B1</b> for correct shape, incorrect position or enlargement correct centre, incorrect scale factor
	(iii) Rotation 90° clockwise oe [Centre] (0, 0) oe	<b>B1</b> <b>B1</b> <b>B1</b>	
9	(a) $2x$ final answer	2	<b>M1</b> for $6x + 4$ or $-4x - 4$
	(b) $3y(y - 2)$ final answer	2	<b>B1</b> for $3(y^2 - 2y)$ or $y(3y - 6)$
	(c) $4a + 20$ or $4(a + 5)$	2	<b>M1</b> for $a + 5 = \frac{b}{4}$ or $4a = b - 20$
	(d) Correct working and [ $x =$ ] 5, [ $y =$ ] -2	3	<b>M1</b> for correctly eliminating one variable  <b>A1</b> for $x = 5$ <b>A1</b> for $y = -2$  If zero scored, <b>SC1</b> for 2 values satisfying one of the original equations <b>SC1</b> if no working shown, but 2 correct answers given