



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

---

**MATHEMATICS**

**0580/32**

Paper 3 (Core)

**October/November 2016**

MARK SCHEME

Maximum Mark: 104

---

**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.

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 2016 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.

This syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

---

This document consists of **6** printed pages.

© UCLES 2016



**[Turn over**

Page 2	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2016	0580	32

### 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)	12	1	
	(ii)		1	
	(iii)	Fantasy	1	
	(iv)	$\frac{4}{50}$ oe isw	1	
	(b) (i)	3	2	M1 for 25th and 26th value or list of at least first or last 26 values
	(ii)	3.1 nfw	3	M1 for $7 \times 1 + 2 \times 14 + 3 \times 12 + 4 \times 5 + 5 \times 8 + 6 \times 4$ or better  M1 dep for <i>their</i> $155 \div 50$
	(c) (i)	$\frac{90}{360}$ oe	1	
	(ii)	125	3	B1 150 soi  M1 for $\frac{their150}{360} \times 300$ oe
2	(a) (i)	Octagon	1	
	(ii)	2	1	
	(iii)	Correct enlargement	2	B1 for enlargement with incorrect scale factor (sf $\neq 1$ ) or B1 for any four sides correct
	(b) (i)	Rotation 90° clockwise oe [Centre] (0, 0) oe	B1 B1 B1	
	(ii)	Correct reflection Vertices (-2, -1), (-2, -2), (-5, -2)	1	



Page 4	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2016	0580	32

Question	Answer	Mark	Part marks
(e)	Ruled line through (4, 0) and (0, 4)	1	
(f)	(4.1 to 4.3, -0.1 to -0.5) (-0.1 to -0.3, 4.1 to 4.5)	2FT	<b>B1FT</b> for one correct or both $x$ -values correct or both $y$ -values correct
5 (a) (i)	40 to 42	2	<b>M1</b> for 8.0 to 8.4 or 80 to 84 seen
(ii)	104 to 108	1	
(iii)	$D$ marked correctly	2	<b>B1</b> for bearing $215^\circ$ <b>B1</b> for distance 6 cm
(iv)	$P$ marked correctly with arcs	3	<b>B1</b> for arc centre $C$ radius 5 cm <b>B1</b> for two correct pairs of intersecting arcs (for perpendicular bisector of $AB$ ) <b>B1</b> $P$ marked in correct position
(b) (i)	05 45 [0]6 15 [0]7 30 [0]6 20 06 50 08 05	3	<b>B1</b> for each
(ii)	42.9 or 42.85 to 42.86	2	<b>M1</b> for $\frac{25}{35}$ or $\frac{25}{0.583\dots}$ or $\frac{25}{35} \times 60$ oe
6 (a)	4 or 1	2	<b>B1</b> for 2 or 3 or 6 or 8 or 12 or 24 or $2^2$ or $1^2$
(b)	125	1	
(c) (i)	3.5 or $3\frac{1}{2}$	1	
(ii)	4913	1	
(iii)	0.0625 or $\frac{1}{16}$	1	
(d)	6.174	2	<b>M1</b> for $\frac{1}{2} \times 0.7 \times 4.2^2$ soi by 6.17
(e) (i)	1	1	
(ii)	$b^5$	1	
(iii)	$c^{-4}$ or $\frac{1}{c^4}$	1	

Page 5	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2016	0580	32

Question	Answer	Mark	Part marks	
7	(a) (i)	122	1	
	(ii)	625.86 cao	3	M2 for $15.25 \times 1.08 \times 38$ oe soi by 626 or 625.9 or M1 for $15.25 \times 1.08$ soi by 16.47 or for $15.25 \times 38$ soi by 579.5  If zero scored, SC1 for 131.76 or 5006.88
	(b)	Mei 9.61 cao	3	M1 for $425 \times 1.45$  M1FT for $\pm(\text{their } 625.86 - \text{their } 616.25)$  If zero scored, SC1 for [€] 6.62 to 6.63
(c)	554.36	3	M2 for $500 \times 1.035^3$ oe or M1 for $500 \times 1.035^k$ , $k \neq 1, 3$  If zero scored, SC1 for answer of 54.36 or 54.35 or 54.4 or 54.358... 54.359	
8	(a) (i)	Tangent	1	
	(ii)	Chord	1	
	(b) (i)	Angle [in] semicircle	1	
	(ii)	20	2	M1 for $\frac{1}{2} \times 8 \times 5$
	(iii)	$[AB = ] \sqrt{8^2 + 5^2} = 9.433\dots$ or 9.434	M2	M1 for $[AB^2 = ] 8^2 + 5^2$
	(iv)	69.8 or 69.9 or 69.84 to 69.91	2	M1 for $\pi \times \left(\frac{9.43}{2}\right)^2$ or $\pi \times (4.72)^2$
	(v)	71.3 to 71.4	2	M1 for $\frac{\text{their b(iv)} - \text{their b(ii)}}{\text{their b(iv)}} [\times 100]$  or $\left(1 - \frac{\text{their b(ii)}}{\text{their b(iv)}}\right) [\times 100]$  or $[100 - ] \frac{\text{their b(ii)}}{\text{their b(iv)}} \times 100$

Page 6	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2016	0580	32

Question	Answer	Mark	Part marks
9 (a)		1	
(b)	$\begin{array}{ccc} 4 & 5 & 11 \\ 10 & 13 & 31 \end{array}$	4	<b>B1</b> for 11 <b>B1</b> for 31 <b>B2</b> for 4, 5, 10, 13 or <b>B1</b> for two of 4, 5, 10, 13
(c) (i)	$n + 1$ oe final answer	1	
(ii)	$3n + 1$ oe final answer	2	<b>B1</b> for $3n + k$ or $cn + 1$ $c \neq 0$
(d)	26	2	<b>M1FT</b> for <i>their</i> <b>c(ii)</b> = 76 or better or <b>M1</b> implied by answer of 25