



---

**MATHEMATICS**

**0580/31**

Paper 3 (Core)

**October/November 2017**

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 International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the October/November 2017 series for most Cambridge IGCSE<sup>®</sup>, Cambridge International A and AS Level components and some Cambridge O Level components.

---

© IGCSE is a registered trademark.

This document consists of **5** printed pages.

**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	Marks	Partial marks
1(a)(i)	16	1	
1(a)(ii)	-15	1	
1(b)(i)	Friday	1	
1(b)(ii)	6	1	
1(c)(i)	16 05 or 4 05 pm	1	
1(c)(ii)	4	1	
2(a)	180.5[0]	3	<b>M2</b> for $3 \times 24 + 5 \times 12.50 + 46$ oe or <b>M1</b> for $3 \times 24$ or $5 \times 12.50$ or better, soi by 72 or 62.5
2(b)	69.12	2	<b>M1</b> for $64 \times 1.08$ oe
2(c)	12	3	<b>M2</b> for $(\frac{280}{250} - 1) \times 100$ or $\frac{280-250}{250} \times 100$ oe or <b>M1</b> for $\frac{280}{250} - 1$ or $\frac{280}{250} \times 100$ or $\frac{280-250}{250}$ oe
2(d)	561	3	<b>M1</b> for $5.5 \times 8.5$ soi by 46.75 <b>M1</b> for <i>their</i> $46.75 \times 12$
2(e)	4287.66	3	<b>M2</b> for $3600 \times (1 + \frac{6}{100})^3$ oe or <b>M1</b> for $3600 \times (1 + \frac{6}{100})^2$ oe soi by 4044.96 If zero scored, <b>SC2</b> for 687.6576, 687.658, 687.66, 687.65, 687.7, 688 or 690

Question	Answer	Marks	Partial marks
3(a)(i)	Written test and a valid reason	1	
3(a)(ii)	Positive	1	
3(a)(iii)	(45,10) indicated	1	
3(a)(iv)	42	1	
3(b)(i)	29	2	<b>M1</b> for 6 in the correct order, 8 14 17 21 23 29... or ... 29 30 32 39 41 48
3(b)(ii)	27.5 or 27.45 to 27.46	2	<b>M1</b> for all 11 numbers added, allowing one error or omission, and divided by 11
4(a)(i)	Correct point plotted	1	
4(a)(ii)	Right-angled or scalene	1	
4(a)(iii)	8 4	1	
4(a)(iv)(a)	0.5 oe	2	<b>M1</b> for attempt at rise $\div$ run
4(a)(iv)(b)	[y =] 0.5x oe	1FT	Correct or FT <i>their (iv)(a)</i>
4(b)(i)	...1 ...-5 -5...1 15	3	<b>B2</b> for 3 or 4 correct or <b>B1</b> for 1 or 2 correct
4(b)(ii)	Correct curve	4	<b>B3FT</b> for 8 or 9 points correctly plotted or <b>B2FT</b> for 6 or 7 points correctly plotted or <b>B1FT</b> for 4 or 5 points correctly plotted
4(b)(iii)	-2.8 1.8	2FT	<b>B1FT</b> for each
5(a)	51.6	2	<b>B1</b> for 4.3[cm]
5(b)	[0]47	1	
5(c)	292	1	
5(d)(i)	Arc centre <i>A</i> radius 7 cm	1	
	Arc centre <i>C</i> radius 3.5 cm	1	
	One point <b>marked</b> at intersection of correct arcs	1	If zero scored, <b>SC1</b> for any arc centred on <i>A</i> or <i>C</i> , or correct point marked with no arcs
5(d)(ii)	504	2	<b>M1</b> for $84 \div$ <i>their</i> time or $84 \times 6$
5(e)	298	2	<b>M1</b> for $118 + 180$ oe

Question	Answer	Marks	Partial marks
6(a)(i)	1, 2, 3, 6, 9, 18 only	2	<b>B1</b> for 4 or 5 correct factors and no extras or 6 correct with one extra
6(a)(ii)	Any multiple of 30	1	
6(a)(iii)	46.2	1	
6(a)(iv)	15.625	1	
6(a)(v)	5	1	
6(b)	$2^3 \times 3^2$	2	<b>M1</b> for a complete factor tree or 2, 2, 2, 3, 3 clearly identified as factors
6(c)	240	2	<b>M1</b> for [16=] $2^4$ or $2 \times 2 \times 2 \times 2(\times 1)$ or [30=] $2 \times 3 \times 5(\times 1)$ or lists of multiples of both at least up to 240, or any product that equals 240  or <b>B1</b> for $240n$
6(d)	2000 or 8 pm	3	<b>M1</b> for [LCM of 6 and 9 =] 18(00) or <b>M1</b> for lists of multiples <b>B1FT</b> for “2 am” + <i>their</i> 18 correctly worked out soi OR <b>B2</b> for [clock A = 2] 8, 14, 20... and [clock B = 2] 11, 20... or <b>B1</b> for [clock A = 2] 8, 14, 20...or [clock B = 2] 11, 20...
7(a)(i)	$\frac{6}{20}$ oe	1	
7(a)(ii)	$\frac{5}{20}$ oe	1	
7(a)(iii)	0	1	
7(b)	[0].28 oe	2	<b>M1</b> for $1 - 0.3 - 0.24 - 0.18$ oe or $1 - 0.72$ oe
7(c)	$\frac{8}{20}$	1	Accept $8 \div 20$
	$\frac{6}{15}$	1	Accept $6 \div 15$
	Comparing the two fractions with equal denominators or as decimals	1	e.g. $\frac{8}{20} = \frac{24}{60}$ and $\frac{6}{15} = \frac{24}{60}$ or both shown equal to $\frac{2}{5}$ or [0].4 or 40%

Question	Answer	Marks	Partial marks
8(a)	$8x + 7$ final answer	2	<b>B1</b> for $10x + 15$ or $-2x - 8$ or $8x + j$ or $kx + 7$ as final answer
8(b)(i)	$6x$ final answer	1	
8(b)(ii)	$5a$ final answer	1	
8(c)	$10y + 12$ or $2(5y + 6)$ final answer	3	<b>M1</b> for $2(3y + 1) + 2(2y + 5)$ oe <b>B1</b> for $10y + j$ or $ky + 12$ ( $k \neq 0$ )
8(d)	$7(m + 6) + 3m = 182$ or $7m + 42 + 3m = 182$	2	<b>B1</b> for $m + 6$ or $7t + 3m = 182$
	14	3	<b>M1</b> for $7m + 42$ [ $+ 3m = 182$ ] <b>M1</b> for $7m + 3m = 182 - 42$ or better OR <b>M2</b> for $[m=]$ $(182 - (6 \times 7)) / (7 + 3)$ or better or <b>M1</b> for $182 - (6 \times 7)$ or better
9(a)(i)	7.5	2	<b>M1</b> for $\frac{1}{2} \times 5 \times 3$ or evidence of counting squares
9(a)(ii)	Correct enlargement	2	<b>B1</b> for one line correctly scaled
9(b)(i)	Rotation [centre] (0,0) oe $180^\circ$	3	<b>B1</b> for each
9(b)(ii)	Correct reflection with points (-3,-3), (-1,-5) and (-6,-6)	2	<b>B1</b> for reflection in $y = k$ or $x = -1$
9(b)(iii)	Correct translation with points (4,4), (2,2) and (-1,5)	2	<b>B1</b> for a correct horizontal translation (5 to the right) or a correct vertical translation (1 up)
10(a)(i)	30	1	
10(a)(ii)	add 8 oe	1	
10(a)(iii)	$8n - 10$ oe final answer	2	<b>B1</b> for $8n + j$ or $kn - 10$ ( $k \neq 0$ )
10(b)	9	1	
10(c)	34	1	