



MATHEMATICS

0580/31

Paper 3 (Core)

October/November 2017

MARK SCHEME

Maximum Mark: 104

Published

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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
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	M2 for $3 \times 24 + 5 \times 12.50 + 46$ oe or M1 for 3×24 or 5×12.50 or better, soi by 72 or 62.5
2(b)	69.12	2	M1 for 64×1.08 oe
2(c)	12	3	M2 for $(\frac{280}{250} - 1) \times 100$ or $\frac{280-250}{250} \times 100$ oe or M1 for $\frac{280}{250} - 1$ or $\frac{280}{250} \times 100$ or $\frac{280-250}{250}$ oe
2(d)	561	3	M1 for 5.5×8.5 soi by 46.75 M1 for <i>their</i> 46.75×12
2(e)	4287.66	3	M2 for $3600 \times (1 + \frac{6}{100})^3$ oe or M1 for $3600 \times (1 + \frac{6}{100})^2$ oe soi by 4044.96 If zero scored, SC2 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	M1 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	M1 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	M1 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	B2 for 3 or 4 correct or B1 for 1 or 2 correct
4(b)(ii)	Correct curve	4	B3FT for 8 or 9 points correctly plotted or B2FT for 6 or 7 points correctly plotted or B1FT for 4 or 5 points correctly plotted
4(b)(iii)	-2.8 1.8	2FT	B1FT for each
5(a)	51.6	2	B1 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 marked at intersection of correct arcs	1	If zero scored, SC1 for any arc centred on <i>A</i> or <i>C</i> , or correct point marked with no arcs
5(d)(ii)	504	2	M1 for $84 \div$ <i>their</i> time or 84×6
5(e)	298	2	M1 for $118 + 180$ oe

Question	Answer	Marks	Partial marks
6(a)(i)	1, 2, 3, 6, 9, 18 only	2	B1 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	M1 for a complete factor tree or 2, 2, 2, 3, 3 clearly identified as factors
6(c)	240	2	M1 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 B1 for $240n$
6(d)	2000 or 8 pm	3	M1 for [LCM of 6 and 9 =] 18(00) or M1 for lists of multiples B1FT for “2 am” + <i>their</i> 18 correctly worked out soi OR B2 for [clock A = 2] 8, 14, 20... and [clock B = 2] 11, 20... or B1 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	M1 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	B1 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	M1 for $2(3y + 1) + 2(2y + 5)$ oe B1 for $10y + j$ or $ky + 12$ ($k \neq 0$)
8(d)	$7(m + 6) + 3m = 182$ or $7m + 42 + 3m = 182$	2	B1 for $m + 6$ or $7t + 3m = 182$
	14	3	M1 for $7m + 42$ [$+ 3m = 182$] M1 for $7m + 3m = 182 - 42$ or better OR M2 for $[m=] (182 - (6 \times 7)) / (7 + 3)$ or better or M1 for $182 - (6 \times 7)$ or better
9(a)(i)	7.5	2	M1 for $\frac{1}{2} \times 5 \times 3$ or evidence of counting squares
9(a)(ii)	Correct enlargement	2	B1 for one line correctly scaled
9(b)(i)	Rotation [centre] (0,0) oe 180°	3	B1 for each
9(b)(ii)	Correct reflection with points (-3,-3), (-1,-5) and (-6,-6)	2	B1 for reflection in $y = k$ or $x = -1$
9(b)(iii)	Correct translation with points (4,4), (2,2) and (-1,5)	2	B1 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	B1 for $8n + j$ or $kn - 10$ ($k \neq 0$)
10(b)	9	1	
10(c)	34	1	