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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
nfww 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)	1605 or 405 pm	**1**	
1(c)(ii)	4	**1**	
2(a)	180.5[0]	**3**	**M2** for 3 × 24 + 5 × 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 *their* 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 ÷ run
4(a)(iv)(b)	[y =] 0.5x oe	**1FT**	Correct or **FT** *their* **(iv)(a)**
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 A radius 7 cm	**1**	
	Arc centre C radius 3.5 cm	**1**	
	One point **marked** at intersection of correct arcs	**1**	If zero scored, **SC1** for any arc centred on A or C, or correct point marked with no arcs
5(d)(ii)	504	**2**	**M1** for 84 ÷ *their* time or 84 × 6
5(e)	298	**2**	**M1** for 118 + 180 oe

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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)	20 00 or 8 pm	**3**	**M1** for [LCM of 6 and 9 =] 18(00) or **M1** for lists of multiples **B1FT** for "2 am" + *their* 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%

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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**	

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