Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

MATHEMATICS **0580/32**

Paper 3 (Core) **May/June 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	Mark	Part marks
1(a)	14.9[0]	**3**	**M2** for 3 × 2.8[0] + 2 × 3.25 or better or **B1** for 8.4[0] or 6.5[0]
1(b)	4	**1**	
	3.4[0]	**2**	**M1** for 20 – (*their* 4 × 4.15)
1(c)	8.74	**2**	**M1** for 7.60 × 1.15 oe
1(d)	72	**2**	**M1** for 96 ÷ 4 [× 3]
1(e)(i)	60	**2**	**B1** for two from 9 or 36, 12.5, 11.5
1(e)(ii)	5 nfww	**3**	**M2** for (*their* 60 × 3) ÷ 36 or better or **M1** for *their* 60 × 3 or better or *their* 60 ÷ 36
1(f)	5568	**3**	**M2** for 6.4[0] × 72.5 × 12 or better or **M1** for 6.4[0] × 72.5 or 6.4[0] × 12
2(a)	10*a* final answer	**1**	
2(b)	16*f* – 4*g* final answer or 4(4*f* – *g*) final answer	**3**	**M2** for 2 × (5*f* + 2*g*) + 2×(3*f* − 4*g*) oe or **B1** for 10*f* +4*g* or 6*f* −8*g* or 8*f* −2*g* or 16*f* + *kg* or *kf* – 4*g*
2(c)(i)	125	**2**	**M1** for 5 × 7 + 9 × 10 or better
2(c)(ii)	85	**2**	**M1** for $4 \times 5^2 - 3 \times 5$ or better
2(d)	7	**3**	**M1** for 15*x* – 30 [= 75] or 3*x* – 6 = 15 **M1FT** for correct second step
2(e)(i)	*x* + 4 4*x* 4*x* – 6	**2**	**B1** for any two correct
2(e)(ii)	*x* + *x*–5 + *x*+4 + 4*x* + 4*x*–6 = 125	**1**	

Question	Answer	Mark	Part marks
2(e)(iii)	12	**2**	**M1** for $11x = 125 + 7$ or $x - \frac{7}{11} = \frac{125}{11}$ or better
3(a)(i)	62	**1**	
3(a)(ii)(a)	$\frac{17}{84}$ oe isw	**1**	
3(a)(ii)(b)	$\frac{21}{38}$ oe isw	**1**	
3(a)(ii)(c)	$\frac{164}{210}$ oe isw	**1**	
3(a)(iii)	43.5 oe	**2**	**M1** for an ordered list giving at least the first 5 or the last 5 numbers in order or 42 and 45 identified
3(b)	3.44	**3**	**M2** for $(1 \times 5 + 2 \times 8 + 3 \times 12 + 4 \times 14 + 5 \times 7 + 6 \times 4) \div 50$ implied by $172 \div 50$ or **M1** for $(1 \times 5) + (2 \times 8) + (3 \times 12) + (4 \times 14) + (5 \times 7) + (6 \times 4)$ or 172
3(c)(i)	4 points plotted within tolerance	**2**	**B1** for 2 or 3 points plotted within tolerance
3(c)(ii)	(10, 35) indicated	**1**	
3(c)(iii)	Positive	**1**	
3(c)(iv)	Correct ruled line	**1**	
3(c)(v)	28 to 32	**1**	If zero scored, **FT** their line of best fit if positive
4(a)(i)	36	**1**	
4(a)(ii)	4	**1**	
4(a)(iii)	11	**1**	
4(a)(iv)	36 or 4 or both	**1**	
4(a)(v)	27	**1**	

Question	Answer	Mark	Part marks
4(b)	160 cao	**2**	**M1** for any common multiple 160 n or any product that equals 160 or two lists of correct multiples of each number or either number correctly reduced to its prime factors
4(c)(i)	8.3	**1**	
4(c)(ii)	27	**1**	
5(a)	Rotation	**1**	
	(0, 0) oe	**1**	
	90° [anticlockwise] oe	**1**	
5(b)	Enlargement	**1**	
	(0, 2)	**1**	
	[sf=]2	**1**	
5(c)(i)	Correct reflection points at (4, –2), (8, –2) and (4, –8)	**1**	
5(c)(ii)	Correct translation points at (–7, 5), (–4, 5) and (–4, 7)	**2**	**B1** for $\begin{pmatrix}-2\\k\end{pmatrix}$ or $\begin{pmatrix}k\\3\end{pmatrix}$
5(c)(iii)	Correct rotation points at (–2, –2), (–4, –2) and (–2, –5)	**2**	**B1** for rotation of 180° about the wrong centre
6(a)	Completely correct ruled triangle with arcs	**3**	**B1** for AC of length 8 cm **B1** for BC of length 7 cm or if zero scored, **M1** for two correct intersecting arcs If zero scored, **SC1** for ruled triangle with arcs with AC of length 7 cm and BC of length 8 cm

Question	Answer	Mark	Part marks
6(b)	Accurate ruled bisector of angle *S* with two correct pairs of arcs and reaching side *QR*	**B2**	**B1** for correct ruled bisector of angle *S* which reaches *QR* drawn without arcs or with wrong arcs or correct short line with arcs or 2 pairs of correct arcs with no line
	Accurate ruled bisector of side *SR* with two correct pairs of arcs and reaching side *PQ*	**B2**	**B1** for correct ruled bisector of *SR* which reaches *PQ* drawn without arcs or with wrong arcs or correct short line with arcs or 2 pairs of correct arcs with no line
	correct region shaded	**B1dep**	Dep. on a ruled line through angle *S* and a ruled line through side *SR*
7(a)(i)	270	**1**	
7(a)(ii)	152	**3**	**M1** for 180 – 118 soi by 62 **M1** for 180 – 90 – *their* 62 soi by 28 or better **and** 180 – *their* 28 or 90 + *their* 62
7(a)(iii)	108	**3**	**M2** for $\sqrt{117^2 - 45^2}$ or better or **M1** for $[\ldots]^2 + 45^2 = 117^2$ or better
7(b)	40	**3**	**M1** for 180 – 171 soi by 9 **M1** for 360 ÷ *their* 9
8(a)	–3, –5, –7.5, 7.5, 3.75, 3	**3**	**B2** for 4 or 5 correct **B1** for 2 or 3 correct
8(b)	Correct curve drawn	**4**	**B3FT** for 9 or 10 points correctly plotted or **B2FT** for 7 or 8 points correctly plotted or **B1FT** for 5 or 6 points correctly plotted
8(c)	$1.8 \leqslant x < 2$	**1**	If zero scored, then **FT** their graph
9(a)(i)	32	**1**	
	38	**1FT**	**FT** *their* 32 + 6
9(a)(ii)	–2	**1**	
	–8	**1FT**	**FT** *their* –2 – 6

Question	Answer	Mark	Part marks
9(b)	$11n + 3$ oe final answer	**2**	**B1** for $11n + k$ (k may be 0) or $jn + 3$ ($j \neq 0$) or $11n + 3$ or $14 + 11(n – 1)$ seen but not as final answer
9(c)	–5	**1**	
9(d)(i)	$n^2 + 1$ oe	**1**	
9(d)(ii)	$3n^2$ oe	**1**	