Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

MATHEMATICS **0580/33**

Paper 3 (Core) **October/November 2018**

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.

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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

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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)	26 USA Bali Caribbean, Brazil	**4**	**B1** for each
1(a)(ii)	900	**2**	**M1** for $\frac{180}{72}\times 360$ or 180×5 oe
1(b)(i)	1845	**3**	**M1** for [3 ×] 450 × 0.7 **M1** for 2 × 450
1(b)(ii)	10 40	**2**	**B1** for 11 40 or [0]8 29 or 1 hr 11 [mins]
1(b)(iii)	85.2[0]	**2**	**M1** for [3.5 +] 2.15 × 38 soi
1(b)(iv)	75	**2**	**M1** for 1335 ÷ 17.8
2(a)	Trapezium	**1**	
2(b)(i)	Enlargement [SF] 3 [centre] (−5, 0)	**3**	**B1** for each
2(b)(ii)	Rotation 180° [centre] (0, 0) oe	**3**	**B1** for each
2(c)(i)	Shape with vertices at (6, −1) (5, −1) (6, −2) (5, −3)	**2**	**B1** for $\begin{pmatrix} k \\ -4 \end{pmatrix}$ or $\begin{pmatrix} 8 \\ k \end{pmatrix}$
2(c)(ii)	Shape with vertices at (7, 3) (6, 3) (6, 2) (7, 1)	**2**	**B1** for reflection in $x = k$ or $y = 2$
2(d)	13.5	**1**	
3(a)	60	**2**	**B1** for 6 [cm]
3(b)(i)	255	**1**	
3(b)(ii)	Subtract 180 from *their* **(b)(i)**	**1**	**FT** *their* **(b)(i)** if greater than 180

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Question	Answer	Marks	Partial Marks
3(c)(i)	*D* in correct position	**2**	**B1** for *D* 9.6 cm from *C* **B1** for *D* 100° from *C*
3(c)(ii)	64	**2**	**M1** for 96 ÷ 1.5 oe
3(c)(iii)	60	**2**	**M1** for 96 ÷ 8 × 5 oe
4(a)	Correct pattern drawn	**1**	
4(b)(i)	17 11	**2**	**B1** for 17 in correct position If 0 scored **SC1** for *their* 17 – 6 correct
4(b)(ii)	Subtract 6 oe	**1**	
4(c)(i)	$4n + 7$ oe final answer	**2**	**B1** for $4n + k$ or $jn + 7$, $j \neq 0$
4(c)(ii)	No, [because] 30.5 is not a whole number oe	**2**	**M1** for *their* **(c)(i)** = 129 or better
5(a)(i)	[0].66	**2**	**M1** for 1.24 × 3.5
5(a)(ii)	3500	**1**	
5(b)	11	**2**	**M1** for 10 ÷ [0].85 oe soi by 11.7[6]...
5(c)	609	**2**	**M1** for [0].87 × 700 oe
5(d)	21.4 or 21.42 to 21.43	**2**	**M1** for $\frac{18+5+23+40+28+19+17}{7}$ or 150 ÷ 7
5(e)	2 correct simultaneous equations e.g. $4a + 2p = 1.96$ and $7a + 3p = 3.24$	**B2**	Allow equations working in cents or dollars **B1** for one correct equation
	Correctly equating one set of coefficients	**M1**	**FT** *their* equations
	Correct method to eliminate one variable	**M1**	**FT** *their* equations Dependent on the coefficients being the same for one of the variables. Correct consistent use of addition or subtraction using *their* equations
	[apple =] 0.3[0]	**A1**	
	[plum =] 0.38	**A1**	If **M0M0** scored **SC1** for 2 correct answers given or **SC1** for 2 values satisfying one of *their* two original equations.
6(a)	Six hundred (and) two thousand (and) forty seven	**1**	
6(b)(i)	Any multiple of 14	**1**	

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Question	Answer	Marks	Partial Marks
6(b)(ii)	3136	**1**	
6(b)(iii)	47	**1**	
6(b)(iv)	1	**1**	
6(c)	156	**2**	**M1** for (12 =) 2, 2, 3 and (78 =) 2, 3, 13 or for 2, 2, 3, 13 or for list of multiples of 12 and 78 to at least 156 If 0 scored **SC1** for 156*k*
6(d)	6	**2**	**B1** for 2 or 3 as final answer
6(e)	$2^4 \times 3^3$ or $2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3$	**2**	**M1** for a complete factor tree with at most one error or 2, 2, 2, 2, 3, 3, 3 clearly identified as factors or **B1** for a correct product that equals 432
7(a)	−1.2, −1.5, 1.5	**2**	**B1** for 2 correct
7(b)	Correct curve	**4**	**B3FT** for 11 or 12 points correctly plotted or **B2FT** for 9 or 10 points correctly plotted or **B1FT** for 6, 7 or 8 points correctly plotted
7(c)	1.2 to 1.4	**1**	**FT** *their* **(b)**
7(d)(i)	Correct ruled line	**1**	
7(d)(ii)	(−2.6 to −2.3, −2.6 to −2.3,) and (2.3 to 2.6, 2.3 to 2.6)	**2**	**FT** $y = x$ drawn and *their* curve **B1FT** for one correct, or both *x* values correct or both *y* values correct
8(a)(i)	$\frac{4}{20}$ oe	**1**	
8(a)(ii)	0	**1**	
8(a)(iii)	$\frac{17}{20}$ oe	**1**	
8(b)(i)	9.75 or 9.746 to 9.747	**3**	**M2** for $\sqrt{12^2 - 7^2}$ soi or **M1** for $7^2 + BC^2 = 12^2$ soi
8(b)(ii)	33.5 or 33.49 or 33.492 to 33.494	**1**	**B1 FT** *their* **(b)(i)** × 2 + 14

Question	Answer	Marks	Partial Marks
8(c)	Correct construction and region shaded	**5**	**B2** for arc radius 7.5 cm, centre *P* or **B1** for short arc radius 7.5 cm, centre *P* or **B1** for arc, any radius centre *P* **B2** for angle bisector with correct arcs or **B1** for angle bisector with incorrect or no arcs **B1** for region **dep** on **B1**(arc) and **B1**(bisector)
9(a)	Tangent	**1**	
9(b)	Radius drawn on circle	**1**	
9(c)(i)	90 radius [and] tangent [at 90]	**2**	**B1** for each
9(c)(ii)	90 angle [in a] semicircle [= 90]	**2**	**B1** for each
9(d)(i)	63.6 or 63.61 to 63.63	**2**	**M1** for $4.5^2 \times \pi$
	cm^2	**1**	
9(d)(ii)	5.16 or 5.162 …	**2**	**M1** for $\sin 35 = \frac{BC}{9}$ or better

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