Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

MATHEMATICS **0580/23**

Paper 2 (Extended) **October/November 2017**

MARK SCHEME

Maximum Mark: 70

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.

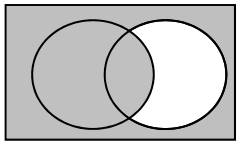
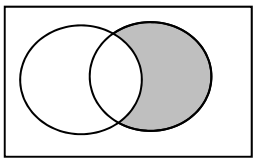
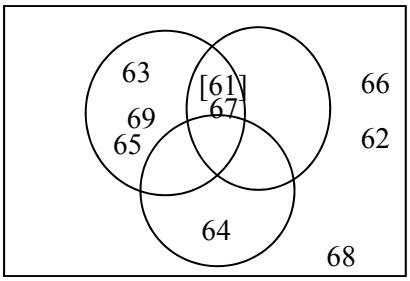
Cambridge International is publishing the mark schemes for the October/November 2017 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.

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	2h 32 min	**1**	
2	3.06 or 3.056…	**1**	
3	66.2 or 66.17 to 66.18	**1**	
4	Kite	**1**	
5	$9(2x + 3y)$ final answer	**1**	
6	$\frac{2}{3}$ oe	**1**	
7	1263.21	**2**	**M1** for $1200 \times \left(\frac{100 + 2.6}{100}\right)^2$ oe
8	87.77.. − 8.77.. oe	**M1**	Allow $\frac{87 - 8}{90}$ for **M1**
	$\frac{79}{90}$	**A1**	Accept $\frac{79k}{90k}$
9	$x \leqslant -1.2$ oe final answer	**2**	**B1** for –1.2 oe or **M1** for correct step to collect x's and numbers
10	64.8	**3**	**M2** for $2400 \times 30^3 \div 100^3$ oe or **M1** for 30^3 or 0.3^3 soi or *their* volume $\div 100^3$
11	150	**3**	**M2** for $(12 - 2) \times 180 \div 12$ or $180 - 360 \div 12$ or **M1** for $(12 - 2) \times 180$ or $360 \div 12$ soi 30
12	1.1[0]	**3**	**M2** for $0.88 \div \frac{100 - 20}{100}$ oe or **M1** for 0.88 associated with 80 [%]

Question	Answer	Marks	Partial marks
13	$\frac{22}{7}$ or $\frac{5}{4}$ $2\frac{1}{7} - \frac{1}{4}$	**B1**	Allow $\frac{22k}{7k}$ or $\frac{5k}{4k}$ Correct step for dealing with mixed numbers
	$\frac{88}{28}$ or $\frac{35}{28}$ $2\frac{4}{28}$ or $\frac{7}{28}$	**M1**	Correct method to find common denominator e.g. $3\frac{4}{28}$ or $1\frac{7}{28}$
	$1\frac{25}{28}$ $1\frac{25}{28}$	**A1**	
14	$(3x + 5)(x - 4)$ [=0]	**M2**	**M1** for $(3x + b)(x + a)$ where $ab = -20$ or $3a + b = -7$
	4 and $-\frac{5}{3}$ oe	**A1**	If zero scored, **SC1** for 2 correct answers from no working or other methods
15	$25x^2 - 8$ final answer	**3**	**M1** for $(5x - 3)^2 + 6(5x - 3) + 1$ **M1** for $25x^2 - 15x - 15x + 9$ soi or better
16	$\frac{12m}{p - 4y}$ or $\frac{-12m}{4y - p}$ final answer	**4**	**M1** for $12m + 4xy = xp$ or $3m = \frac{xp}{4} - xy$ **M1** for $12m = xp - 4xy$ or $3m = x(\frac{p}{4} - y)$ **M1** for $12m = x(p - 4y)$ or $\frac{3m}{\frac{p}{4} - y} = x$ **M1** for $\frac{12m}{p - 4y}$ To a maximum of 3 marks for an incorrect answer
17(a)	1, –4 and –9	**1**	
17(b)	Yes because 13 is an integer oe	**3**	**B2** for $[n =] 13$ or **M2** for $\sqrt{((848 - 3) \div 5)}$ or $5 \times 13^2 + 3$ [= 848] or **M1** for $5n^2 + 3 = 848$ oe
18	73.6 or 73.63 to 73.64	**4**	**B3** for 27.4 or 27.36… OR **M2** for $\frac{5.9 \sin 79}{12.6}$ oe or **M1** for $\frac{\sin[C]}{5.9} = \frac{\sin 79}{12.6}$ oe and **M1dep** for $180 - 79 -$ *their C* (dep on at least **M1** earned)

Question	Answer	Marks	Partial marks
19(a)	$\begin{pmatrix} 11 & -6 \\ -5 & 6 \end{pmatrix}$	**2**	**M1** for two correct elements
19(b)	$\frac{1}{12}\begin{pmatrix} -6 & 0 \\ -5 & -2 \end{pmatrix}$ oe isw	**2**	**M1** for $k\begin{pmatrix} -6 & 0 \\ -5 & -2 \end{pmatrix}$ $(k \neq 0)$ or det = 12 soi
20	139 or 139.2 to 139.3	**4**	**M3** for $10^2 + \frac{1}{2} \times \pi \times 5^2$ or **M2** for $\frac{1}{2} \times \pi \times 5^2$ or **M1** for radius = 5 or [area of square]10^2
	cm^2	**1**	
21(a)	3.4	**3**	**M1** for 2 + 5 + 4 + 2 + 1 + 3 + 2 + 7 + 6 + 2 [34] **M1** for *their* 34 ÷ 10
21(b)	5	**2**	**M1** for 5, 5 identified
21(c)	[Day] 10	**1**	
22(a)	19	**1**	
22(b)	138	**3**	**M2** for 180 – (19 + 23) or 67 + (180 – 90 – 19) or better or **M1** for angle $AEB = 23$ or angle $AEC = 42$
22(c)	90	**2**	**M1** for angle $EBC = 71$ or angle $EAB = 90$
23(a)	 $A \cup B'$  $A' \cap B$	**2**	**B1** for each
23(b)(i)		**3**	**B2** for 6 or 7 correct **B1** for 4 or 5 correct

Question	Answer	Marks	Partial marks
23(b)(ii)	3	**1FT**	**FT** *their* $\mathrm{n}\left(E \cup F \cup G\right)'$
23(b)(iii)	$\varnothing$ or { }	**1FT**	**FT** *their* $E \cap F \cap G$