Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

MATHEMATICS (US) **0444/23**

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	2 h 32 min	**1**	
2	3	**1**	
3	5	**1**	
4	kite	**1**	
5	$9(2x + 3y)$ final answer	**1**	
6	$\frac{2}{3}$ oe	**1**	
7	235	**2**	**M1** for 180 + 55 or diagram with a correct angle seen other than the 55° bearing or diagram with the angle to be worked out clearly indicated.
8	5.76×10^9	**2**	**M1** for figs 576 or 0.36×10^9 or 54×10^8
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	540	**3**	**M2** for $6000 \times 30^2 \div 100^2$ oe **M1** for 30^2 or 0.3^2 (implied by figs 540) or $\div 100^2$
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	$[x =] 3$ $[y =] -2$	**3**	**M1** for correctly eliminating one variable **A1** for $x = 3$ **A1** for $y = -2$ If zero scored, **SC1** for two values satisfying one of the original equations

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	$14 + 8\sqrt{5}$		**3**	**B1** for $9 + 3\sqrt{5} + 3\sqrt{5} + 5$ oe **B1** for $2\sqrt{5}$
16	8		**3**	**M2** for $\frac{5 \times 0.8}{\sin 30}$ oe or **M1** for $\frac{\sin 30}{5} = \frac{\sin A}{BC}$ oe
17	$\frac{12m}{p-4y}$ 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
18(a)	1, –4 and –9		**1**	
18(b)	Yes because 11 is an integer oe		**3**	**B2** for [n =] 11 or **M2** for $\sqrt{((608 – 3) \div 5)}$ or $5 \times 11^2 + 3$ [= 608] or **M1** for $5n^2 + 3 = 608$ oe
19	[k =] 18 [c =] 144		**4**	**B3** for $k = 18$ **B1** for $c = 144$ OR **M3** for $12^2 + \frac{1}{2}\pi 6^2$ or **M2** for $\frac{1}{2}\pi 6^2$ or **M1** for radius = 6 or for 12^2

Question	Answer	Marks	Partial marks
20(a)(i)	$-\mathbf{a} + \mathbf{b}$ oe	**1**	
20(a)(ii)	$-\frac{1}{4}\mathbf{a} + \frac{1}{4}\mathbf{b}$	**1**	**FT** *their* **(a)(i)**
20(a)(iii)	$\frac{1}{4}\mathbf{a} + \frac{3}{4}\mathbf{b}$ oe	**2**	**M1** for correct unsimplified answer or for a correct route
20(b)	$-\frac{1}{2}\mathbf{a} + \frac{3}{2}\mathbf{b}$ oe	**2**	**M1** for correct unsimplified answer or for a correct route
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 **M1** for angle *AEB* = 23 or angle *AEC* = 42
22(c)	90	**2**	**M1** for angle *EBC* = 71 or angle *EAB* = 90
23(a)	125 or 216 or 343 or 512 or 729	**1**	
23(b)	97	**1**	
23(c)	$7\% < \frac{7}{10} < 0.71 < \sqrt{49}$	**3**	**B2** for two of 0.07, 0.7, 7 soi or **M1** for converting at least two values oe
23(d)	$\frac{4}{9}$	**2**	**M1** for numerator 4 or denominator 9 or for final answer $\frac{9}{4}$