Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

MATHEMATICS (US) **0444/33**

Paper 3 Core **October/November 2016**

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) (i)	64 81 and no others	2	**B1** for 1 correct and no others or 2 correct and 1 wrong
(ii)	$90k$	1	accept any multiple of 90
(iii)	1, 3, 9, 27 only	2	**B1** for three correct and no extras or four correct and one extra
(iv)	16	2	**B1** for 2, 4 or 8 as answer
(b) (i)	$\frac{9}{4}$ or 2.25 oe	1	
(ii)	$\frac{1}{2}$ oe	1	
(iii)	625	1	
(iv)	1.318 cao	2	**B1** for $\frac{112}{85}$ or 1.317647059 rounded to 3 or 5 or more sig figs
2 (a)	258[.00] 25.56 758.56	1 1 1FT	**FT** their two previous answers + 475
(b) (i)	85	1	
(ii)	739.2[0]	3	**M1** for 4400 – 3740 or soi by 660 **M1** for *their* 660 × 1.12 oe
(c)	26.75 cao	1	
(d)	Van and 12.6 > 12.4 oe or 0.0792 < 0.0806 or 0.982 < 1	2	**B1** for 12.6[…] or 0.0806[…] or 0.982[…]
(e)	2800	2	**M1** for [2×] 4200 ÷ (1 + 2) oe or soi by 1400

Question	Answer	Mark	Part marks
3 (a) (i)	[0].45	1	
(ii)	6.115 or 6.12	2	**M1** for adding the lengths (soi by 48.92) ÷ 8
(b) (i)	4 correct points	2	**B1** for 2 or 3 correct points
(ii)	Negative	1	
(iii)	No [because] the faster an athlete runs the further they jump oe	1	Accept any correct statement
(iv)	Correct ruled line of best fit	1	
(v)	Correct distance from *their* line of best fit	1FT	**Strict FT** from straight line with negative gradient
4 (a) (i)	35	1	
(ii)	74	1	
(b)	43 **and** valid reasons	3	reasons include external angle of a triangle equals the sum of the internal opposite angles or angles on a straight line [sum to 180] and angles in a triangle [sum to 180] **B2** for 43 or **M1** for 180 – 128 soi 52 or 128 – 85 **B1** for valid reasons
(c)	32.2 or 32.23…	2	**M1** for sin […] = 8 ÷ 15 oe
(d) (i)	$[AB] = \sqrt{300^2 + 225^2}$	2	**M1** for $300^2 + 225^2$
(ii)	15 35	4	**M1** for 375 ÷ 450 or [0].833[…] **M1** for *their* [0].833 × 60 or soi by 50 **M1** for 14 45 + *their* 50

Question	Answer	Mark	Part marks
5 (a)	*B* correct	**1**	
	C correct	**2FT**	**B1** for *C* correct without arcs or correct pair of arcs or correct lengths reversed with arcs If zero scored, **SC1** for *AB*=8 or *AC*=6 or *BC*=5
(b)	14.9 to 15.3	**1**	Correct or **FT**
(c)	203	**2**	**M1** for 180 + 23
6 (a)	325 150 450 75	**3**	**B2** for 3 correct or **B1** for 2 correct or **M1** for 45 ÷ 18 soi by 2.5
(b) (i)	632	**2**	**M1** for (395 × 8) ÷ 5 oe
(ii)	0.632	**1FT**	**FT** *their* **(b)(i)** ÷ 1000
(c) (i)	$\frac{9C+160}{5}$ or $(9C+160)\div 5$ or $\frac{9C}{5}+32$	**2**	**B1** for $9C+\frac{160}{5}$ or 9*C* + 160 ÷ 5
(ii)	356	**1**	

Question	Answer	Mark	Part marks
7 (a)	$6h$ oe	**1**	
(b) (i)	$4x$ oe	**1**	
(ii)	x^2 oe	**1**	
(c)	7.5	**5**	**M1** for $2x + 1 + x + 3 + 2x + 1 + x + 3$ oe **M1** for $6x + 8$ or *their* expression simplified correctly **M1** for *their* $6x + 8 = 53$ **M1** for a correct first step in solving *their* linear equation
(d) (i)	–3	**1**	
(ii)	$6a + b$ final answer	**2**	**B1** for $6a$ or [+] b
(e) (i)	$5x – 20$ final answer	**1**	
(ii)	$x^3 + 3x$ final answer	**2**	**B1** for x^3 or [+] $3x$
(f)	$4x(2x – 1)$ final answer	**2**	**B1** for $x(8x – 4)$ or $4(2x^2 – x)$ or $2(4x^2 – 2x)$ or $2x(4x – 2)$
8 (a)	Correct reflection	**1**	
(b)	Correct translation	**2**	**B1** for either correct horizontal or vertical movement
(c)	Rotation [about] (0,0) 90° [anti-clockwise] oe	**1** **1** **1**	
(d)	Enlargement [centre] (0,0) [sf] 2	**1** **1** **1**	

Question		Answer	Mark	Part marks
9	(a)	15 8 … 0 … 0 … 8	3	**B1** for 8 and 8 in the correct place **B1** for 0 and 0 in the correct place **B1** for 15 in the correct place
	(b)	Correct curve	4	**B3FT** for 7 or 8 points correctly plotted **FT** their table or **B2FT** for 5 or 6 points correctly plotted **FT** their table or **B1FT** for 3 or 4 points correctly plotted **FT** their table
	(c)	Correct ruled line	1	
	(d)	−1.8 or −1.7 or −1.6 3.6 or 3.7 or 3.8	2FT	**B1FT** for one correct or **B1FT** for both correct answers as co-ordinates or **B1FT** for both answers correct to more than 1dp
10	(a)	$0 < x < 10$ cao	2	accept $0 < x$, $x < 10$ **B1** for $k < x < 10$ or $0 < x < k$ or $0 < ... < 10$ or $0 \leqslant x \leqslant 10$
	(b)	-5 [< f(x) <] 25	2	**B1** for each
	(c)	$x - 5$	1	
	(d)	4	2	**M1** for $3x - 5 = 7$
	(e)	$g(x) = f(x + 4)$ indicated only	1	