
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
nfw	not from wrong working
soi	seen or implied

Question	Answer	Mark	Part marks		
1 (a) (i)	64	2	B1 for 1 correct and no others or 2 correct and 1 wrong		
	81 and no others				
	(ii)	90 <i>k</i>	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]	1	FT their two previous answers + 475		
	<u>25.56</u>	1			
	758.56	1FT			
	(b) (i)	85		1	
	(ii)	739.2[0]		3	M1 for 4400 – 3740 or soi by 660 M1 for <i>their</i> 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 $48.92 \div 8$)
	(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 <i>their</i> 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 $\sin [\dots] = 8 \div 15$ oe
	(d) (i) $[AB] = \sqrt{300^2 + 225^2}$	2	M1 for $300^2 + 225^2$
	(ii) 1535	4	M1 for $375 \div 450$ or $[0].833[\dots]$ M1 for <i>their</i> $[0].833 \times 60$ or soi by 50 M1 for $1445 + \textit{their}$ 50

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Question	Answer	Mark	Part marks
5 (a)	<i>B</i> correct	1	
	<i>C</i> correct	2FT	B1 for <i>C</i> 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	3	B2 for 3 correct or B1 for 2 correct or M1 for $45 \div 18$ soi by 2.5
	150		
	450		
	75		
	(b) (i)	632	2
(ii)	0.632	1FT	FT <i>their</i> (b)(i) $\div 1000$
(c) (i)	$\frac{9C+160}{5}$ or $(9C+160) \div 5$	2	B1 for $9C + \frac{160}{5}$ or $9C + 160 \div 5$
	or $\frac{9C}{5} + 32$		
(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	<p>M1 for $2x + 1 + x + 3 + 2x + 1 + x + 3$ oe</p> <p>M1 for $6x + 8$ or <i>their</i> expression simplified correctly</p> <p>M1 for <i>their</i> $6x + 8 = 53$</p> <p>M1 for a correct first step in solving <i>their</i> linear equation</p>
(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	1	
	[about] (0,0)	1	
	90° [anti-clockwise] oe	1	
(d)	Enlargement	1	
	[centre] (0,0)	1	
	[sf] 2	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 $0 < \dots < 10$ or $0 \leq x \leq 10$
	(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	