



Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

MATHEMATICS

0580/33

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)	258[.00]	1	FT 475 + <i>their</i> two previous answers	
	<u>25.56</u>	1		
	758.56	1FT		
	(b) (i)	85		1
	(ii)	739.2[0]		3
(c)	26.75 cao	1	M1 for 4400 – 3740 or soi by 660 M1 for <i>their</i> 660 × 1.12 oe	
(d)	Van <u>and</u> 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	
2 (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	Accept any correct statement
	(iii)	No [because] the faster an athlete runs the further they jump oe	1	
	(iv)	Correct ruled line of best fit	1	
	(v)	Correct distance from <i>their</i> line of best fit	1FT	Strict 1FT from straight line with negative gradient

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Question	Answer	Mark	Part marks	
3	(a) (i)	35	1	
	(ii)	74	1	
	(b)	43 and valid reasons	3	reasons include exterior angle [of a triangle] equals the sum of the interior 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 by 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)	15 35	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 soi
4	(a) (i)	<i>B</i> correct <i>C</i> correct with arcs	1 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 $BC=5$
	(ii)	$[0]37$ to $[0]41$	1	Correct or FT
	(iii)	203	2	M1 for $180 + 23$
	(b)	Correct perpendicular bisector of <i>PT</i> with arcs	2	B1 for correct perpendicular bisector of <i>PT</i> with no / incorrect arcs or two correct pairs of intersecting arcs
		arc centre <i>W</i> radius 6 cm	2	B1 for any arc centred on <i>W</i>
	both points marked on intersection of line and arc	1dep	dep on an attempt at bisector and attempt at the arc	

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Question	Answer	Mark	Part marks	
5	(a) (i)	64 81 and no others	2	B1 for 1 correct and no others or 2 correct and 1 wrong accept any multiple of 90 B1 for three correct and no extras or four correct and one extra B1 for 2, 4 or 8 as answer B1 M1 FT <i>their</i> $\frac{11}{6}$ A1 B1 Dep on A1
	(ii)	90k	1	
	(iii)	1, 3, 9, 27 only	2	
	(iv)	16	2	
	(b)	$\frac{11}{6}$ oe	B1	
		$\frac{11}{6} \times \frac{5}{2}$ oe	M1	
		$\frac{55}{12}$ oe	A1	
		$4\frac{7}{12}$	B1	
	(c) (i)	20 Add 3 oe	1 1	
	(ii)	-7 Subtract 8 oe	1 1	
(iii)	16 Differences increase by 1 oe	1 1		
(iv)	125 Cube numbers	1 1		
6	(a)	6h oe	1	M1 for $2x + 1 + x + 3 + 2x + 1 + x + 3$ oe M1 for $6x + 8$ or <i>their</i> expression simplified correctly M1 for <i>their</i> $6x + 8 = 53$ M1 for a correct first step in solving <i>their</i> linear equation B1 for $6a$ or $[+] b$ B1 for x^3 or $[+] 3x$ B1 for $x(8x - 4)$ or $4(2x^2 - x)$ or $2(4x^2 - 2x)$ or $2x(4x - 2)$
	(b) (i)	4x oe	1	
	(ii)	x^2 oe	1	
	(c)	7.5	5	
	(d)	$6a + b$ final answer	2	
	(e) (i)	$5x - 20$ final answer	1	
	(ii)	$x^3 + 3x$ final answer	2	
	(f)	$4x(2x - 1)$ final answer	2	

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Question	Answer	Mark	Part marks
7 (a)	Correct reflection	1	B1 for either correct horizontal or vertical movement
(b)	Correct translation	2	
(c)	Rotation	1	
	[about] (0,0) oe	1	
	90° [anti-clockwise] oe	1	
(d)	Enlargement	1	
	[centre] (0,0) oe	1	
	[sf] 2	1	
8 (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 correctly plotted points or B2FT for 5 or 6 correctly plotted points or B1FT for 3 or 4 correctly plotted points
(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
9 (a)	325 150 450 75	3	B2 for 3 correct or B1 for 1 or 2 correct or M1 for $45 \div 18$ soi by 2.5
(b) (i)	632	2	M1 for $(395 \times 8) \div 5$ oe
(ii)	0.632	1FT	FT <i>their</i> (b)(i) $\div 1000$