Cambridge International Examinations
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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
nfww not from wrong working
soi seen or implied

Question	Answer	Mark	Part marks
1 (a)	258[.00] 25.56 758.56	**1** **1** **1FT**	 **FT** 475 + *their* two previous answers
(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
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**	
(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 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 […] 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 1445 + *their* 50 soi
4 (a) (i)	*B* correct *C* correct with arcs	1 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
(ii)	[0]37 to [0]41	1	Correct or **FT**
(iii)	203	2	**M1** for 180 + 23
(b)	Correct perpendicular bisector of *PT* with arcs	2	**B1** for correct perpendicular bisector of *PT* with no / incorrect arcs or two correct pairs of intersecting arcs
	arc centre *W* radius 6 cm	2	**B1** for any arc centred on *W*
	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
(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)	$\frac{11}{6}$ oe	**B1**	
	$\frac{11}{6} \times \frac{5}{2}$ oe	**M1**	**FT** *their* $\frac{11}{6}$
	$\frac{55}{12}$ oe	**A1**	
	$4\frac{7}{12}$	**B1**	**Dep** on A1
(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**	
(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)	$6a + b$ 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 $2x(4x - 2)$

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Question	Answer	Mark	Part marks
7 (a)	Correct reflection	**1**	
(b)	Correct translation	**2**	**B1** for either correct horizontal or vertical movement
(c)	Rotation [about] (0,0) oe 90° [anti-clockwise] oe	**1** **1** **1**	
(d)	Enlargement [centre] (0,0) oe [sf] 2	**1** **1** **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 ÷ 18 soi by 2.5
(b) (i)	632	**2**	**M1** for (395 × 8) ÷ 5 oe
(ii)	0.632	**1FT**	**FT** *their* **(b)(i)** ÷ 1000

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