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CAMBRIDGE INTERNATIONAL MATHEMATICS **0607/62**

Paper 6 (Extended) **May/June 2016**

MARK SCHEME

Maximum Mark: 40

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.

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Abbreviations

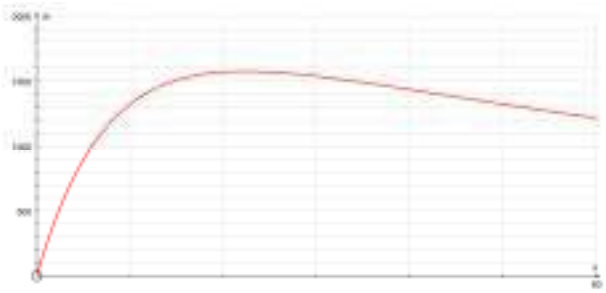
awrt answers which round to
cao correct answer only
dep dependent
FT follow through after error
isw ignore subsequent working
oe or equivalent
SC Special Case
nfww not from wrong working
soi seen or implied

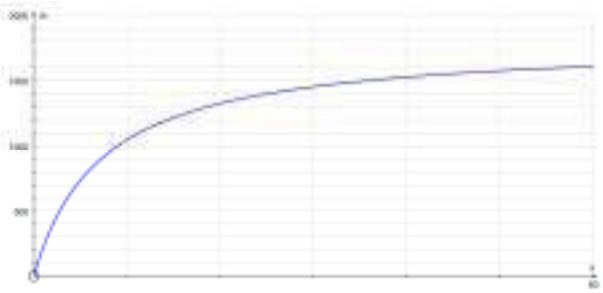
A INVESTIGATION SUMS OF CONSECUTIVE INTEGERS

Question	Answer	Marks	Part Marks
1	27	**1**	**C** opportunity
2 (a)	<table><tr><th>Sequence</th><th></th><th>Mean</th><th>Sum</th></tr><tr><td>5, 6, 7, 8, 9, 10</td><td>6</td><td>7.5</td><td>45</td></tr><tr><td>10, 11, 12, …….. , 40</td><td>31</td><td>25</td><td>775</td></tr><tr><td>2, 3, 4, 5, 6, 7, 8</td><td>7</td><td>5</td><td>35</td></tr><tr><td>9, 10, 11, 12</td><td>4</td><td>10.5</td><td>42</td></tr><tr><td>4, 5, 6, 7, 8, 9, 10 OR 24, 25</td><td>7 2</td><td>7 24.5</td><td>49</td></tr></table>	**5**	**B1** for each row **C** opportunity
(b)	add and divide by 2 oe	**1**	
3 (a)	100	**1**	
(b)	$\frac{2k+99}{2}$ oe final answer	**1**	
(c)	*their* (a) × *their* (b) isw	**1FT**	$50(2k + 99)$ oe
4	number of terms = n mean = $\frac{2k+n-1}{2}$ or [mean =] $\frac{k+k+n-1}{2}$	**2**	**B1** for each statement
5 (a)	[$2k$ +] $n - 1$ is even and even + even = even or even / 2 is an integer	**1**	
(b)	[$2k$ +] $n - 1$ is odd and odd + even = odd or odd / 2 = … **.**5	**1**	

Question	Answer	Marks	Part Marks
6 (a)	[1 and 84] 3 and 28 7 and 12 8 and 10.5 [12 and 7] [28 and 3] [84 and 1] [21 and 4] [4 and 21]	**3**	**B1** for each pair, allowing reversed order
(b)	for any 2 correct sequences	**1**	27, 28, 29 9, 10, 11, 12, 13, 14, 15 7, 8, 9, 10, 11, 12, 13, 14
7	Any one of 32, 64, 128, …	**1**	**C** opportunity
Communication seen in one of 1, 2(a), 2(b), 7		**1**	

B MODELLING TRAFFIC FLOW

Question	Answer	Marks	Part Marks
1 (a)	15	**1**	**C** opportunity
(b)	$\frac{1000x}{60\times 60}$ oe	**1**	
2	$\frac{1}{125}x^2$ or $0.008x^2$ or $8\times10^{-3}\,x^2$ oe	**2**	**M1** $20 = k\,50^2$ or better
3 (a)	$1000x$	**1**	
(b)	Numerator = distance in one hour Denominator = distance between cars oe	**1**	
(c)	Correct shape 	**2**	**B1** for a curve with a single max turning point, above the x–axis at $x = 60$ soi **C** opportunity
(d)	1570 or 1572 to 1573	**1FT**	**FT** *their k*, $0.002 \leqslant k \leqslant 0.8$
(e) (i)	22.3 to 22.4 [km/h]	**1FT**	**FT** *their k*, $0.002 \leqslant k \leqslant 0.8$
(ii)	It is a low speed oe	**1**	Dependent on (e)(i) < 45
(f) (i)	decreases oe	**1**	
(ii)	increases oe	**1**	

Question	Answer	Marks	Part Marks
4 (a)	$\frac{1000x}{4+0.556x}$ oe isw	1	**C** opportunity
(b)		1	correct shape, through (0,0) implied, and reaching $x = 50$
(c)	$1000x = 7200 + (1800 \times \textit{their}\ 0.556)x$ or $\frac{1000x}{1800} = \textit{their}0.556x + 4$ (or better)	M1FT	**FT** $\frac{1000x}{4+\textit{their}0.556x}$ only
	No, and *their* correct x given or No, and correct working leading to "x is negative" or No, and correct working leading to an impossible equation	A1	**C** opportunity If x found then must be correct.
5	Anything which rounds to 35 [km/h]	1FT	**FT** *their k*, $0.002 \leqslant k \leqslant 0.1$ and $\frac{1000x}{4+\textit{their}0.556x}$
Communication in three of 1(a), 3(c), 4(a) and 4(c).		2	**C1** if seen in two of them.