

CAMBRIDGE INTERNATIONAL EXAMINATIONS**Cambridge International General Certificate of Secondary Education****MARK SCHEME for the May/June 2015 series****0607 CAMBRIDGE INTERNATIONAL MATHEMATICS****0607/42**

Paper 4 (Extended), maximum raw mark 120

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.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2015 series for most Cambridge IGCSE[®], Cambridge International A and AS Level components and some Cambridge O Level components.

® IGCSE is the registered trademark of Cambridge International Examinations.

Page 2	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – May/June 2015	0607	42

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

1	(a) (i)	40 000	3	M2 for $76\,000 \div 1.9$ oe or M1 for $76\,000 = 190\%$ oe soi
	(ii)	521 284 cao	3	M2 for $76\,000 \times 1.9^3$ or $40\,000 \times 1.9^4$ oe or M1 for $76\,000$ (or <i>their</i> 40 000) $\times 1.9^k$, $k \neq 1$ oe seen
	(b)	2035	2	M1 for 76 000 (or <i>their</i> (a)(i) or <i>their</i> (a)(ii)) $\times 1.9^k$ = (or $>$ or $\geq$) 10 000 000 seen $k \neq 1$ or evidence of at least 2 correct trials
2	(a)	Rotation [Anticlockwise] 90° oe [About] (0, 0) oe	1 1 1	Combinations of transformations – lose all 3 marks
	(b)	$\begin{pmatrix} 7 \\ k \end{pmatrix}$ $y = \frac{1}{2}k + 3$	1 1	any k Must be $\frac{1}{2}$ <i>their</i> k from vector
	(c)	Triangle at (1, 2), (2, 2), (1, 6)	2	SC1 for stretch s.f. 2 with $y = 1$ invariant or triangle at (2, 1), (4, 1), (2, 3) i.e. y -axis invariant
3	(a)	82.8 or 82.83...	3	B1 for 9 h 25 m oe or 9.417 oe or 565 [min] M1 for $780 \div 9.416...$ (or <i>their</i> 9 h 25m converted to h)
	(b)	58.2 or 58.23 to 58.24 ... cao	3	M1 for $520 \div 105$ M1 for <i>their</i> 9.41666 – <i>their</i> $(520 \div 105)$ or for <i>their</i> 565 – <i>their</i> $520 \div 105 \times 60$
	(c)	99.96 cao	4	M2 for $\frac{520}{100} \times 6 + \frac{\text{their} 260}{100} \times 8$ soi by 52 or 31.2 + 20.8 or M1 for either, soi by 31.2 or 20.8 M1 for <i>their</i> 52×1.63 soi by 84.76

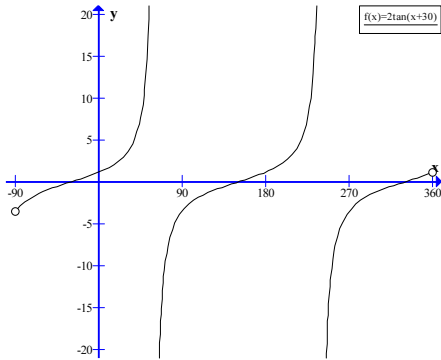
Page 3	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – May/June 2015	0607	42

4	(a)	Good curve with x intercept reasonably placed and maximum reasonably placed on y -axis and minimum in 1st quadrant		
			2	B1 for basic cubic shape (max before min)
	(b)	(0, 6) (2, 2)	1 1	SC1 if answers reversed
	(c)	$2 < k < 6$	2FT	FT <i>their</i> y values from (b) SC1 for $2 \leq k \leq 6$ or for $2 < k < n$ or $n < k < 6$ or for $2 < k \leq 6$ or $n \leq k < 6$ or for $2 < x < 6$
	(d)	Rotational [Order] 2 [About] (1, 4)	1 1 1	
	(e)	$x^3 - 3x^2 + 4$ or $(x - 2)(x - 2)(x + 1)$	1	
5	(a)	5 points plotted correctly	2	B1 for 3 or 4 correct
	(b)	Positive	1	Ignore comments on strength
	(c) (i)	63.6	1	
	(ii)	42	1	Accept 42 000
	(d)	$1.04x - 24.4$	2	or $a = 1.044\dots$, $b = -24.41$ to -24.40 B1 for $y = ax + b$ with either a or b correct or SC1 for $[1.[0]]x - 24$
	(e)	58 800 or 58 790 to 59 150	1FT	FT from <i>their</i> equation

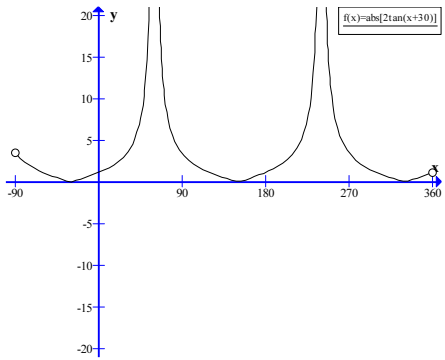
Page 4	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – May/June 2015	0607	42

6	(a)	150	2	M1 for $\sqrt{120^2 + 90^2}$
	(b)	$\tan^{-1} \frac{90}{120}$ oe 53.13... or 36.86 to 36.87 or 106.26 73.739...	M1 A1 A1	i.e. trig ratio for any appropriate angle or M1 [$\cos =$] $\frac{150^2 + 150^2 - 180^2}{2 \times 150 \times 150}$ A1 0.28 oe
	(c)	25 300 or 25 270 to 25 281	3	M2 for $\frac{73.74}{360} \times \pi \times 150^2 + 2 \times \frac{1}{2} \times 120 \times 90$ oe or M1 for $\frac{73.74}{360} \times \pi \times 150^2$ or $2 \times \frac{1}{2} \times 120 \times 90$ oe
	(d)	6.74 to 6.75 or 7	3	M2 for <i>their (c)</i> $\times 8 \times 2 \div 60\,000$ oe or M1 for <i>their (c)</i> $\times 8 \times 2 \div$ figs 6 or <i>their (c)</i> $\times 8 \div 60\,000$ or <i>their (c)</i> $\times 2 \div 60\,000$
7	(a)	$x = -1$ ruled $y = 2$ ruled $y = 2x - 3$ ruled $3x + 5y = 30$ ruled Correct region clearly indicated cao	1 1 2 2 1	B1 for line with gradient 2 or y-intercept -3 B1 for line with negative gradient through (0, 6) or through (10, 0)
	(b) (i)	6.5 to 6.7 cao	1	
	(ii)	7.2 to 7.6 cao	1	
8	(a) (i)	Any counted information	1	e.g. numbers in family, numbers of letters delivered, shoe sizes, marks in a test, number of cats, etc.
	(ii)	Any measured information	1	e.g. lengths, ages, masses, heights
	(b) (i)	160 165	1	
	(ii)	165 170	1	
	(iii)	166	2	M1 for at least 3 midpoints soi
	(iv)	Continuous information oe	1	e.g. lowest/highest anywhere between 150 and 155, using mid-points, grouped data, actual heights unknown, examples of values in an interval

Page 5	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – May/June 2015	0607	42

9	(a) (i)	$\frac{4}{10}, \frac{2}{10}, \frac{4}{10}$ $\frac{5}{11}, \frac{2}{11}, \frac{4}{11}$ $\frac{5}{10}, \frac{2}{10}, \frac{3}{10}$	1 1 1	
	(b) (i)	$\frac{4}{121}$ oe	2	M1 for $\frac{2}{11} \times \text{their } \frac{2}{11}$
	(ii)	$\frac{32}{110}$ oe	3	M2 for $\frac{5}{11} \times \text{their } \frac{4}{10} + \frac{4}{11} \times \text{their } \frac{3}{10}$ oe or M1 for one of above products without incorrect extras
	(iii)	$\frac{189}{605}$ oe	3	M2 for $\frac{5}{11} \times \text{their } \frac{2}{10} + \frac{2}{11} \times \text{their } \frac{5}{11} + \frac{2}{11} \times \text{their } \frac{4}{11} + \frac{4}{11} \times \text{their } \frac{2}{10}$ oe or M1 for 2 of above products or one of $\left(\frac{5}{11} + \frac{4}{11}\right) \times \text{their } \frac{2}{10}, \quad \frac{2}{11} \times \left(\text{their } \frac{5}{11} + \text{their } \frac{4}{11}\right)$
10	(a)	Correct curve with no overlaps at 60 and 240, x intercepts at approximately -30, 150, 330 	3	B2 for 'correct' but with overlaps and/or inaccurate intercepts B1 for 1 branch correct
	(b)	38.2 or 38.19 to 38.2 218 or 218.1 to 218.2	1 1	
	(c)	$x = 60$ $x = 240$	1 1	

Page 6	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – May/June 2015	0607	42

(d)	<i>their (a)</i> with negative y parts reflected in x-axis 	2FT	B1FT for 1 branch correct
11 (a) (i)	117 or 116.8 ...	4	M2 for $\sin[\theta] = \frac{70\sin 35}{45}$ oe or M1 for $\frac{\sin[\theta]}{70} = \frac{\sin 35}{45}$ oe M1 for $180 - \text{their } \theta$
(ii)	42.4 or 42.36 to 42.37	4	M2 for $[\cos[\theta]] = \frac{70^2 + 80^2 - 55^2}{2 \times 70 \times 80}$ or M1 for $55^2 = 70^2 + 80^2 - 2 \times 70 \times 80 \times \cos[\theta]$ A1 for 0.739 or 0.7388 ... or $\frac{8275}{11200}$ or $\frac{1655}{2240}$ or $\frac{331}{448}$
(b)	21.1 to 21.3	2FT	M1 for $45\sin(145 - \text{their (a)(i)})$ oe
12 (a)	4 nfw	2	B1 for $\frac{6}{4+1}$ oe seen or M1 for $5\left(\frac{6}{4x+1}\right) - 2$
(b) (i)	$\frac{6}{20x-7}$ final answer	2	M1 for $\frac{6}{4(5x-2)+1}$
(ii)	$\frac{x+2}{5}$ oe final answer	2	M1 for $y+2=5x$ or $x=5y-2$ or $\frac{y}{5}=x-\frac{2}{5}$ or better
(c) (i)	$\frac{1}{x+1}$ final answer	3	M2 for $\frac{5x-2}{(5x-2)(x+1)}$ oe or M1 for $\frac{5x-2}{(5x+a)(x+b)}$ oe where $ab = -2$ or $a+5b=3$ or SC1 for $(5x-2)(x+1)$ seen

Page 7	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – May/June 2015	0607	42

	(ii) $\frac{26x-13}{(4x+1)(5x-2)}$ oe final answer	3	M1 for common denominator $(4x+1)(5x-2)$ soi M1 for $6(5x-2) - (4x+1)$ oe
13	(a) $ABF = DEF$ (alternate angles) $BAF = EDF$ (alternate angles) $AFB = DFE$ ([vert] opposite angles)	1 + 1	One mark for first fully correct and one for second fully correct. or B1 for any 2 pairs of angles <u>identified</u> without a reason or with an incorrect reason
	(b) (i) 4.8 oe	3	<u>Method 1</u> Triangles ABF, CEB [where $x = AB$] M2 for $\frac{10}{6} = \frac{8}{x}$ oe or M1 for $\frac{BC}{AF} = \frac{EC}{AB}$ oe <u>Method 2</u> Triangles ABF, DEF [where $x = AB$] M2 for $\frac{8-x}{x} = \frac{4}{6}$ oe or M1 for $\frac{FD}{AF} = \frac{ED}{AB}$ oe <u>Method 3</u> Triangles EFD, EBC [where $y = ED$] M2 for $ED = 3.2$ or M1 for $\frac{BC}{FD} = \frac{EC}{ED} \left[= \frac{10}{4} = \frac{8}{y} \right]$ oe
	(ii) $\frac{4}{9}$ oe	1	
	(iii) $\frac{4}{30}$ oe	2	M1 for Area of $ABF = \frac{3}{10}$ Area of $ABCD$ or ratio of EFD to $EBC = 4 : 25$ oe soi or correct use of $\frac{1}{2}ab\sin C$ $\frac{\frac{1}{2} \times their ED \times 4}{10 \times their DC}$