CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2014 series

0607 CAMBRIDGE INTERNATIONAL MATHEMATICS

0607/63   Paper 6 (Extended), maximum raw mark 40

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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A   INVESTIGATION   THE END RESULT

1	(a)	(i)	$\dfrac{1}{12}$ oe	1	**C** opportunity
			$\dfrac{1}{12}$ oe	1	
		(ii)	$\dfrac{2}{15}$ oe	1	**C** opportunity
			$\dfrac{1}{15}$ oe	1	
		(iii)	Any correct pair	1	Any pair of fractions whose denominators are n and $n + 1$ for any integer $n > 0$ Not $\dfrac{1}{4}$ and $\dfrac{1}{5}$ Not $\dfrac{1}{3}$ and $\dfrac{1}{4}$
	(b)	(i)	$\dfrac{b-a}{ab}$ oe	1	
		(ii)	$\dfrac{1}{ab}$ oe	1	
	(c)		$\dfrac{1}{n+1}$	1	

2	(a)	(i)	$\dfrac{12}{35}$ oe	1	**C** opportunity
		(ii)	12, 35, 37 oe	1	**C** opportunity
		(iii)	$\dfrac{20}{99}$	1	**C** opportunity
		(iv)	Yes oe and correct reason	1FT	**FT** their $\dfrac{20}{99}$ e.g. $\sqrt{20^2 + 99^2} = 101$
	(b)	(i)	$\dfrac{p+q}{pq}$ isw	1	
		(ii)	$p + q$, pq, $[pq + 2]$	1	
		(iii)	$(pq + 2)^2 = their(p+q)^2 + their(pq)^2$	1	
			$p^2q^2 + 4pq + 4 = p^2 + q^2 + 2pq + p^2q^2$	1	
			Correct further step leading to given answer	1	May be unsimplified
		(iv)	$q = p + 2$ oe	1	
			$q = p - 2$ oe	1	
			Communication seen in at least two of **1a(i)**, **1a(ii)**, **2(a)(i)**, **2a(ii)** or **2(a)(iii)**	1	

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B	MODELLING		RESCUE MISSION		
1	(a)	(i)	Maximums are 10 and 20 and minimum in total is 80	1	
		(ii)	$5x + 7y \geq 35$	1	
		(iii)	$3x + 4y < 24$	1	
	(b)	(i)	7	1	
		(ii)	5	1	If 0 scored in **(i)** and **(ii)**, **SC1** for 8 and 6
	(c)		$40x + 65y$	1	
2	(a)		Line from (0, 4) to (8, 0)	1	
			Line from (0, 5) to (7, 0)	1FT	
			Line from (0, 6) to (8, 0)	1FT	
			Line $y = their$ 5 and line $x = their$ 7	1FT	
			Correct region	1	
	(b)		[They are] fractions oe	1	
	(c)		6 1 305	2	**B1** for at least 2 correct **C** opportunity
3			3 3 10	1	
4			Identify one solution using any valid comparison of time and cost.	1FT	e.g. An extra $10 000 will reduce the time by one hour

5	(a)	$5x + 7y + 4z \geqslant 35$ $10x + 20y + 8z \geqslant 80$ oe $3x + 4y + 2z < 24$ $0 \leqslant x \leqslant 7$ $0 \leqslant y \leqslant 5$ $0 \leqslant z \leqslant 11$ $40x + 65y + 50z$	2	**FT** their x and y from **1(b)** **B1** for any 5 correct
	(b)	e.g. [The graph used in part 2 is] 2 [dimensional; the problem is now] 3 [dimensional]. oe www	1	2 not 3 variables All statements must be valid
		Communication in **2(c)**	1	

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