

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the May/June 2015 series

0444 MATHEMATICS (US)

0444/21

Paper 2, maximum raw mark 70

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

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

Qu.	Answers	Mark	Part Marks
1	9.5	1	
2	0.0001 oe	1	
3	$2x^2 + 8x - 35$ final answer	2	B1 for 2 correct terms in answer or M1 for $2x^2 + 3x$ or $5x - 35$
4	Paul and correct reason with 28% oe shown or conversion of 26% to fraction and common denominator	2	B1 for $\frac{7}{25}$ seen as decimal or % (0.28) or conversion of 26% to fraction and common denominator
5	$24u^2w^3$ final answer	2	B1 for 2 correct elements in final answer
6	$5\sqrt{3}$	2	B1 for $[\sqrt{12} =] 2\sqrt{3}$ or $[\sqrt{27} =] 3\sqrt{3}$
7	10	3	M2 for $\sqrt{(7--1)^2 + (11-5)^2}$ oe or M1 for $(7--1)$ oe or $(11-5)$ oe
8	$\frac{5}{21}$ cao	3	B1 for $\frac{9}{5}$ or $\frac{5}{9}$ or $\frac{63}{35}$ or $\frac{35}{63}$ M1 for $\frac{3}{7} \times their \frac{5}{9}$ or $\frac{15}{35} \div \frac{63}{35}$ oe
9 (a)	2	1	
(b)	8	2	M1 for $4^{\frac{3}{2}}$ or $\left(\frac{1}{2}\right)^{-3}$ or $\left(\frac{1}{64}\right)^{-\frac{1}{2}}$
10 (a)	$4n$ oe final answer	1	
(b)	$3n^2 + 8$ oe final answer	2	M1 for a quadratic expression as final answer or $3n^2 + 8$ oe in working

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11	18	3	<p>M2 for $2(2 + 4)^2 = p(-2 + 4)^2$ oe</p> <p>M1 for $p = \frac{k}{(q + 4)^2}$</p> <p>A1 for $k = 72$</p>
12 (a)	5	2	M1 for $18 \times \frac{1000}{60 \times 60}$ oe
(b)	54	1FT	FT 270 ÷ their (a)
13 (a)	2b	1	<p>SC1 for answer trapezoid with reason PM parallel to QR</p>
(b)	Parallelogram	1	
	<p>PM equal and parallel to QR</p> <p>or</p> <p>PM or PS parallel to QR</p> <p>and MR found = a so 2 pairs of parallel sides</p>	1	
14	<p>$y < 8$</p> <p>$y \geq 6 - x$ oe and $y \geq x + 2$ oe</p>	1	<p>B2 for either $y \geq 6 - x$ oe or $y \geq x + 2$ oe or</p> <p>SC2 for $y = 6 - x$ oe and $y = x + 2$ oe</p> <p>or SC1 for $y > 6 - x$ or $y = 6 - x$ or $y > x + 2$ or $y = x + 2$</p>
		3	
15	5300	3	<p>B2 for 300</p> <p>or M2 for $5000 + \frac{5000 \times 2 \times 3}{100}$ oe</p> <p>or M1 for $\frac{5000 \times 2 \times 3}{100}$ oe</p>
16 (a)	$2 \times 3 \times 5$	2	B1 for 2, 3, 5 as prime factors
(b)	90	2	<p>B1 for $90k$</p> <p>or $2 \times 3 \times 3 \times 5$</p> <p>or for listing multiples of each up to 90</p>
17	<p>$x = 3$</p> <p>$y = -1$</p>	4	<p>M1 for correctly equating one set of coefficients</p> <p>M1 for correct method to eliminate one variable</p> <p>A1 $x = 3$</p> <p>A1 $y = -1$</p> <p>If zero scored SC1 for 2 values satisfying one of the original equations</p>

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18 (a)	7.5 oe	2	M1 for $[10] \times \frac{6}{8}$ oe
(b)	18	2	M1 for $\left(\frac{6}{8}\right)^2$ or $\left(\frac{8}{6}\right)^2$ oe or $\frac{32 \times 2}{8} \times \frac{6}{8}$ or $\frac{32 \times 2}{10} \times \frac{6}{8}$
19 (a)	$(p+t)(y+2x)$ final answer	2	B1 for $y(p+t)+2x(p+t)$ or $p(y+2x)+t(y+2x)$
(b)	$7(h+k)(h+k-3)$ final answer	2	B1 for $7((h+k)^2-3(h+k))$ or $(h+k)(7(h+k)-21)$
20	45π	3	M1 for $\frac{1}{3} \times \pi \times 3^2 \times 9$ (27π) M1 for $\frac{1}{2} \times \frac{4}{3} \times \pi \times 3^3$ (18π) or SC2 for final answer 63π or $141.3\dots$
21 (a)	2.3×10^{12}	2	M1 for 20×10^{11} or 0.3×10^{12} seen or correct answer not in scientific notation e.g. 23×10^{11} or $2\,300\,000\,000\,000$
(b)	$a+100b$ or $a+b \times 10^2$	1	
22	F C A E	1, 1 1, 1	
23 (a)	-13	1	
(b)	$-3x-1$ or $5-3(x+2)$	1	
(c)	$9x-10$	2	M1 for $5-3(5-3x)$
(d)	$\frac{5-x}{3}$ final answer oe	2	M1 for correct first step e.g. $y+3x=5$ or $\frac{y}{3}=\frac{5}{3}-x$ or $y-5=-3x$ or better or for interchanging x and y e.g. $x=5-3y$, this does not need to be the first step