

**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

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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	<b>B1</b> for 2 correct terms in answer or <b>M1</b> 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	<b>B1</b> 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	<b>B1</b> for 2 correct elements in final answer
6	$5\sqrt{3}$	2	<b>B1</b> for $[\sqrt{12} =] 2\sqrt{3}$ or $[\sqrt{27} =] 3\sqrt{3}$
7	10	3	<b>M2</b> for $\sqrt{(7--1)^2 + (11-5)^2}$ oe or <b>M1</b> for $(7--1)$ oe <b>or</b> $(11-5)$ oe
8	$\frac{5}{21}$ cao	3	<b>B1</b> for $\frac{9}{5}$ or $\frac{5}{9}$ or $\frac{63}{35}$ or $\frac{35}{63}$  <b>M1</b> for $\frac{3}{7} \times \text{their } \frac{5}{9}$ or $\frac{15}{35} \div \frac{63}{35}$ oe
9 (a)	2	1	
(b)	8	2	<b>M1</b> 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	<b>M1</b> for a quadratic expression as final answer or $3n^2 + 8$ oe in working

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

18 (a)	7.5 oe	2	<b>M1</b> for $[10] \times \frac{6}{8}$ oe
(b)	18	2	<b>M1</b> 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	<b>B1</b> for $y(p+t) + 2x(p+t)$ or $p(y+2x) + t(y+2x)$
(b)	$7(h+k)(h+k-3)$ final answer	2	<b>B1</b> for $7((h+k)^2 - 3(h+k))$ or $(h+k)(7(h+k) - 21)$
20	$45\pi$	3	<b>M1</b> for $\frac{1}{3} \times \pi \times 3^2 \times 9$ ( $27\pi$ ) <b>M1</b> for $\frac{1}{2} \times \frac{4}{3} \times \pi \times 3^3$ ( $18\pi$ ) or <b>SC2</b> for final answer $63\pi$ or $141.3\dots$
21 (a)	$2.3 \times 10^{12}$	2	<b>M1</b> for $20 \times 10^{11}$ or $0.3 \times 10^{12}$ seen or correct answer not in scientific notation e.g. $23 \times 10^{11}$ or $2300\ 000\ 000\ 000$
(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	<b>M1</b> for $5 - 3(5 - 3x)$
(d)	$\frac{5-x}{3}$ final answer oe	2	<b>M1</b> 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