MARK SCHEME for the May/June 2015 series

0444 MATHEMATICS (US)

0444/21   Paper 2, maximum raw mark 70

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 $\dfrac{7}{25}$ 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	$\dfrac{5}{21}$ cao	3	**B1** for $\dfrac{9}{5}$ or $\dfrac{5}{9}$ or $\dfrac{63}{35}$ or $\dfrac{35}{63}$ **M1** for $\dfrac{3}{7} \times their\ \dfrac{5}{9}$ or $\dfrac{15}{35} \div \dfrac{63}{35}$ oe
9 (a)	2	1	
(b)	8	2	**M1** for $4^{\frac{3}{2}}$ or $\left(\dfrac{1}{2}\right)^{-3}$ or $\left(\dfrac{1}{64}\right)^{-\frac{1}{2}}$
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

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

18	(a)	7.5 oe	2	**M1** for $[10] \times \dfrac{6}{8}$ oe
	(b)	18	2	**M1** for $\left(\dfrac{6}{8}\right)^2$ or $\left(\dfrac{8}{6}\right)^2$ oe or $\dfrac{32 \times 2}{8} \times \dfrac{6}{8}$ or $\dfrac{32 \times 2}{10} \times \dfrac{6}{8}$
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 $7\big((h + k)^2 - 3(h + k)\big)$ 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 $141.3\ldots$
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)	$\dfrac{5 - x}{3}$ final answer oe	2	**M1** for correct first step e.g. $y + 3x = 5$ or $\dfrac{y}{3} = \dfrac{5}{3} - x$ 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