

1(a)	x^6 final answer	1	
1(b)	$[\pm]\frac{1}{3}$	1	
1(c)	$\frac{1}{2}$	1	
2(a)	144	2	B1 for $(3 \times 4)^2$ or $3^2 \times 4^2$ or better
2(b)	$\frac{x^3}{4}$ final answer	2	B1 for answer $\frac{x^3}{k}$ or $\frac{x^k}{4}$ or for $\left(\frac{x^6}{16}\right)^{\frac{1}{2}}$ seen or for $\left(\frac{4}{x^3}\right)^{-1}$ seen
2(c)(i)	1.333×10^7 final answer	1	
2(c)(ii)	749 or 7.49×10^2 cao	2	M1 for $\frac{4.44 \times 10^{10}}{5.93 \times 10^7}$ oe
2(c)(iii)	739000 or 7.39×10^5	2	M1 for $\frac{(100+23.5)}{100}x = 9.13 \times 10^5$ soi
3(a)	$\frac{2}{3}$ cao	2	M1 for $3^3 = 27$ soi or $3^2 = 9$ soi or $(\sqrt[3]{27})^2$
3(b)	$\frac{x^2}{2}$ final answer	2	B1 for answer $\frac{x^2}{k}$ or $\frac{x^n}{2}$ or for $\left(\frac{2}{x^2}\right)^{-1}$ seen or for $\left(\frac{x^8}{16}\right)^{\frac{1}{4}}$ seen
4(a)	$-\frac{5}{2}$ oe	1	
4b)	$\frac{1}{8x^2}$ or $\frac{1}{8}x^{-2}$ final answer	2	B1 for answer $\frac{1}{kx^2}$ or $\frac{1}{8x^k}$, $k \neq 0$ or for $\left(\frac{1}{2x^{\frac{2}{3}}}\right)^3$ or for $\frac{x}{8x^3}$ or for correct answer seen
5a)	5.3×10^{-5} cao	1	
5b)	1.2×10^{21} cao	2	B1 for 12×10^{20} oe seen or for answer $A \times 10^{21}$ with $1 \leq A < 10$

5(c)	$\frac{2v^5}{5}$ final answer	2	B1 for final answer with two of $\frac{2}{5}$, v^5 and t^0 or $\frac{2v^5}{5}$ seen
5(d)	6.7	1	
6a)	$8x^6$ final answer	1	
6b)	$9t$ final answer	2	B1 for final answer $9t^k$ or ht where $k \neq 0$, $h \neq 0$
7a	$\frac{x^9}{8}$ final answer	2	B1 for final answer $\frac{x^9}{k}$ or $\frac{x^k}{8}$ or for $\left(\frac{x^3}{2}\right)^3$ seen or $\left(\frac{8}{x^9}\right)^{-1}$ seen
7(b)	130 or 131 or 150 nfw	2	M1 for $2.6[2] \times 10^8 \div 2 \times 10^6$ or for $3 \times 10^8 \div 2 \times 10^6$
8(a)	1 cao	1	
8(b)	$9x^6$ final answer	1	
8(c)	$\frac{x}{2}$ final answer	2	B1 for $\left(\frac{x^3}{8}\right)^{\frac{1}{3}}$ seen or for $\left(\frac{2}{x}\right)^{-1}$ seen
9(a)	35	1	
9(b)	8	2	B1 for $\left(\frac{2}{5}\right)^2$ oe soi
9(c)	40 000	1	
10(a)	1.7×10^{-5} , 3.5×10^{-4} , 4.2×10^{-4} , 2.1×10^{-3}	1	
10(b)(i)	5.5×10^{10} cao	1	
10(b)(ii)	$3[.0] \times 10^{20}$ cao	1	
11	$\frac{y^4}{3x}$ final answer	2	B1 for final answer $\frac{y^4}{3x^k}$ or $\frac{y^k}{3x}$ or $\frac{y^4}{kx}$ or $\frac{x^{\frac{5}{2}}y^{\frac{9}{2}}}{3x^2y^2}$ or $\frac{7}{3x^2y^2}$ or M1 for $\left(\frac{y^8}{0.2}\right)^{\frac{1}{2}}$ seen or for $\left(\frac{3x}{.4}\right)^{-1}$ seen

12(a)	1.6×10^6	1	
12(b)	4×10^{-17}	1	
12(c)	2×10^{-2}	1	
13(a)	10	1	
13(b)	-1 nfww	2	B1 for $[4^n =] 2^{2n}$, or $(2^2)^n$; or for $2n = n - 1$
14(a)(i)	1.4×10^{11} cao	1	B1 for $\frac{1}{2} \times 10^{-8}$ seen or 0.5×10^{-8} seen or 0.000 000 005 seen
14(a)(ii)	5×10^{-9} cao	2	
15(a)	25	1	
15(b)	$\frac{1}{5}$; or 0.2	1	
16(a)	3.6×10^8	1	
16(b)(i)	4.5×10^{-6}	1	
16(b)(ii)	$(\pm) 3 \times 10^{-8}$	1	

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