



Exponents and Surds

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1	16	(a) $\frac{p^3}{8}$ or $0.125p^3$	1, 1	Independent marks for letter and no.
		(b) $\frac{9}{8}q^{-1}$	1, 1	Independent marks for letter and no. Allow $1\frac{1}{8}q^{-1}$ or $\frac{9}{8q}$
2	5	2^{10}	2	M1 2^6 or 2^4 seen
3	6	$x + 8$	2	M1 3^8 seen
4	4	0.9^3 0.9^2 $\sqrt{0.9}$ $\sqrt[3]{0.9}$	2	M1 0.94(8683...) 0.96(5489....) 0.8(1) 0.7(29)
5	14	(a) 10(.0)	1	
		(b) $2\frac{1}{2}$, 2.5(0)	2	M1 $2n - 3 = 2$
6	16	(a) $\frac{4}{9}x^8$	2	B1 $\frac{4}{9}$ B1 x^8
		(b) $2y^{-1}$	2	B1 2 B1 y^{-1}
7	3	48	2	B1 for 3 and 16 seen
8	4	(a) 10	1	
		(b) 5.5 oe	1	
9	17	(a) $4x^{-24}$ or $\frac{4}{x^{24}}$	2	B1 $4x^n$ B1 $\frac{k}{x^{24}}$ or kx^{-24} for any numerical k, n
		(b) $\frac{x^2}{16}$	2	B1 $\frac{x^2}{k}$ or B1 $\frac{x^n}{16}$ SC1 $(\frac{x}{4})^2$
10	18 (a)	$27x^9$	2	B1 kx^9 or $27x^n$
	(b)	$25x^4$	2	B1 kx^4 or $25x^n$
11	3	(a) 6.25 cao	1	
		(b) 0.16 cao	1	
12	11	(a) -3	2	M1 $1/2^3$ or 2^{-3}
		(b) 1.5	2	M1 2^{6n} or $6n = 9$
13	4	$\frac{16}{81}$ cao	2	B1 for $\frac{81}{16}, \frac{k}{81}, \frac{16}{k}$ or $(2/3)^4$ seen

14	7	$\frac{1}{9}, \frac{1}{4}$ $\left(\frac{1}{9} + \frac{1}{4}\right) = \frac{4}{36} + \frac{9}{36} = \frac{13}{36}$	M1 E1	Both fractions seen Both fractions over a common denominator and added to give $\frac{13}{36}$
15	8	9	2	M1 $125 = 5^3$
16	14 (a)	$64p^3q^6$	2	B1 $64p^uq^v$ or kp^3q^6
	(b)	$0.5x^{-2}$ or $\frac{1}{2x^2}$ oe	2	B1 $\frac{1}{2x^u}$ oe or $\frac{1}{kx^2}$ oe
17	14 (a)	$p = \frac{3}{8}$ $q = \frac{1}{2}$	2	B2 $p = \frac{9}{64}$ and $q = \frac{1}{4}$ or B1 $p = \frac{3}{8}$ $q \neq \frac{1}{2}$
	(b)	$k = 6$	2	M1 for a correct statement for k e.g. $\frac{5^{-3} + 5^{-4}}{5^{-4}}$ or for the factorisation $5^{-4}(5 + 1) = k \times 5^{-4}$ or $\frac{1}{625}(5 + 1) = \frac{k}{625}$
18	10	Correct working seen	2	M1 for correct step M1 for correct step
19	11	$4w^{64}$	2	B1 for $4w^n$ or kw^{64}
20	11	$3x^4$	2	B1 for kx^4 or $3x^k$
21	13 (a)	$\frac{5}{4}$ oe	1	
	(b)	$4y^6$	2	B1 for ky^6 or y^6 or $4y^k$ or 4 as final answer
22	14 (a)	$8q^{-1}$ or $\frac{8}{q}$	2	B1 for $8q^k$ or kq^{-1}
	(b)	$1/5$ or 0.2	2	M1 for $5^{-2}, \frac{1}{5^2}$ or $[0].04$ seen oe
23	5	0.5^3 0.5^2 0.5 $\sqrt[3]{0.5}$	2	B1 for $0.25, 0.125$ and $0.793\dots$ seen or for three in correct order

24	16 (a)	8	2	B1 for 2^{12} or 4096
	(b)	$2q^{\frac{3}{2}}$	3	B2 for $kq^{\frac{3}{2}}$ as the answer or B1 for $2q^2$ and B1 for $q^{\frac{1}{2}}$ oe nfw
25	17 (a)	$5t^{25}$	2	B1 for $5t^k$ or mt^{25} ($m \neq 0$)
	(b)	-2	1	
	(c)	64	1	
26	6	$3x^6y^4$	2	B1 for x^6 or y^4 in a product on answer line
27	11 (a)	x^6	1	
	(b)	$\frac{x^2}{3}$	2	B1 for answer kx^2 or $\frac{x^k}{3}$ or $\frac{1}{3}$
28	7	$24u^2w^3$ final answer	2	B1 for 2 correct elements in final answer
29	3	$\frac{1}{4}$ or 0.25	1	
30	16 (a) (i)	0.5 or -0.5 or $\frac{1}{2}$ or $-\frac{1}{2}$	1	
	(ii)	4	1	
	(b)	1.37 or 1.37[4...]	1	
31	13 (a)	$4x^9$ final answer	2	B1 for answer kx^9 or $4x^k$ ($k \neq 0$)
	(b)	$2y^{32}$ final answer	2	B1 for answer ky^{32} or $2y^k$ ($k \neq 0$)
32	10 (a)	625	1	
	(b)	9	1	
33	17	$\frac{x^{16}}{2y^4}$ final answer	3	B2 for fraction as final answer with two of x^{16} , 2, y^4 correct and in correct position or B1 for fraction as final answer with one of x^{16} , 2, y^4 correct and in correct position

34	21	(a) (i)	1	1	
		(ii)	m^7	1	
		(iii)	$2p^2$	2	SC1 for $2p^k$ or kp^2 $k \neq 0$
		(b)	$\frac{2}{5}$ or 0.4	2	B1 for 3^5 or 3^{5x} or $243^{\frac{1}{5}}$ or $243^{\frac{2}{5}}$ seen
35	14	(a)	x^8y^7 final answer	2	B1 for answer x^8y^k or x^ky^7 ($k \neq 0$)
		(b)	$27p^6m^{15}$ final answer	2	B1 for 2 correct of $27, p^6, m^{15}$ in a product as answer
36	6		$\frac{1}{8}x^2$ or $0.125x^2$ final answer	2	B1 for answer $\frac{1}{8}x^k$ or nx^2
37	7		$8x^6$ final answer	2	B1 for $8x^k$ or cx^6
38	10		$6x^8$ final answer	2	B1 for $6x^k, 6 \times x^8$ or kx^8 ($k \neq 0$) as final answer
39	2		n^7 final answer	1	
40	9		-7	2	B1 for 3^{-3} or 3^4 or 3^7 or 3^{-7} seen or SC1 for final answer 7