Indices Past Paper Answers GCSE Edexcel – Non - Calculator

1.

tion	Answer	Mark	Mark scheme
(a)	$\frac{8}{27}$	M1	for showing the 4th root of 16 as 2 **and** the 4th root of 81 as 3 **or** $\frac{8}{n}$ $(n \neq 27)$ **or** $\frac{n}{27}$ $(n \neq 8)$ **or** an intention to find the 4th root and cube, eg. $\sqrt[4]{\left(\frac{16}{81}\right)^3}$ or $\left(\sqrt[4]{\frac{16}{81}}\right)^3$ oe
		A1	cao
(b)	0	M1	for writing $\frac{1}{9} = 3^{-2}$, $9\sqrt{3} = 3^{2.5}$, $\frac{1}{\sqrt{3}} = 3^{-0.5}$ as powers of 3, with at least 2 correct **or** for working out $\frac{1}{9} \times 9\sqrt{3} \times \frac{1}{\sqrt{3}} = 1$
		A1	cao

2.

-5	M1	for beginning to combine indices eg $4+n$ or y^{3+2}
	A1	cao

3.

(a)	6	B1	cao	Accept ±6
(b)	1	B1	cao	
(c)	$\frac{1}{9}$	M1	for evidence of working with a cube root eg $\sqrt[3]{27}$ or $\sqrt[3]{729}$ **OR** evidence of working with a reciprocal eg $\frac{1}{27^{2/3}}$ or $\left(\frac{1}{27}\right)^{\frac{2}{3}}$	
		A1	cao	

4.

(a)		10	B1	accept ±10
(b)		25	M1	for $(\sqrt[3]{125})^2$ **or** $\sqrt[3]{125} = 5$ **or** $125^2 = 15625$ **or** $\sqrt[3]{125^2}$
			A1	cao

5.

(a)		$\frac{1}{9}$	M1	for showing a method using either reciprocal or square root e.g. $\frac{1}{n}$ or 9 seen
			A1	cao Accept $\pm\frac{1}{9}$ or 0.1 recurring
(b)		$\frac{16}{25}$	M1	for showing cube root of 64 as 4 and the cube root of 125 as 5 or $\frac{16}{n}$ $(n \neq 25)$ or $\frac{n}{25}$ $(n \neq 16)$ or an intention to find the cube root and square.
			A1	cao Accept 0.64

6.

	1.45	P1	for converting to a common base with at least one correct conversion, eg. $(16 =) 2^4$ or $(8 =) 2^3$
		P1	(dep) for correct use of index laws to derive an equation, eg. $4 \times \frac{1}{5} + x = 3 \times \frac{3}{4}$ oe
		A1	for 1.45 oe (accept $2^{1.45}$)
			OR
		P1	for a process to find the value of 2^x, eg. $8^{\frac{3}{4}} \div 16^{\frac{1}{5}} = 2.73\ldots$
		A2	for 1.45 oe (accept $2^{1.45}$)

7.

a		200	B1	200 or 2×10^2
b		3	B1	12 and $\frac{1}{4}$
			A1	3 cao
c		−2	M1	$81 = 3^4$ or $\frac{1}{81} = 3^{-4}$
			A1	cao

8.

(a)		8	B1	
(b)		$\frac{25}{4}$ oe	M1	for correct first step
			A1	