BASIC RULES OF INDICES-SET-1
WITHOUT FRACTIONAL INDICES

1

(a) Write down the value of x^{-1}, x^0, $x^{\frac{1}{2}}$, and x^2 when $x = \frac{1}{4}$.

Answer (a) x^{-1} ....

$x^0 =$ ....

$x^{\frac{1}{2}} =$ ....

$x^2 =$ .... [2]

MS-1

a) 4, 1, $\frac{1}{2}$, $\frac{1}{16}$ oe isw	B2	allow SC1 for any two correct

2

$81^x = 3$

Find the value of x.

Answer x = ... [1]

MS-2

$\dfrac{1}{4}$ or 0.25	**1**	

3

(a) $3^x = \frac{1}{3}$.
Write down the value of x.

Answer (a) $x =$................................... [1]

(b) $5^y = k$.
Find 5^{y+1}, in terms of k.

Answer (b) $5^{y+1} =$ ....[1]

MS-3			
	(a) -1	1	
	(b) 5k	1	

---

4 Find the value of n in each of the following statements.

(a) $32^n = 1$

Answer(a) n = ... [1]

(b) $32^n = 2$

Answer(b) n = ... [1]

(c) $32^n = 8$

Answer(c) n = ... [1]

MS-4			
	(a) 0	1	
	(b) 0.2 or 1/5	1	
	(c) 0.6 or 3/5	1√	**(b) × 3**

---

5 Find the value of n in the following equations.

(a) $2^n = 1024$

Answer(a) n = ... [1]

(b) $4^{2n-3} = 16$

Answer(b) n = ... [2]

MS-5			
	(a) 10(.0)	1	
	(b) $2\frac{1}{2}$, 2.5(0)	2	**M1** $2n - 3 = 2$

| 6 | $a \times 10^7 + b \times 10^6 = c \times 10^6$

Find c in terms of a and b.
Give your answer in its simplest form.

Answer c = ... [2] |
| MS-6 | $10a + b$ or $a \times 10^1 + b \; (\times 10^0)$ | 2 | **M1** $[a \times 10^7 + b \times 10^6] \div 10^6$ |

| 7 | Find the values of m and n.

(a) $2^m = 0.125$

Answer(a) m = ... [2]

(b) $2^{4n} \times 2^{2n} = 512$

Answer(b) n = ... [2] |
| MS-7 | **(a)** -3 | 2 | **M1** $1/2^3$ or 2^{-3} |
| | **(b)** 1.5 | 2 | **M1** 2^{6n} or $6n = 9$ |

8

(a) $\left(\dfrac{3}{8}\right)^{\frac{3}{8}} \times \left(\dfrac{3}{8}\right)^{\frac{1}{8}} = p^q$

Find the value of p and the value of q.

Answer(a) p = ...

q = ... [2]

(b) $5^{-3} + 5^{-4} = k \times 5^{-4}$

Find the value of k.

Answer(b) k = ... [2]

MS-8

(a) $p = \dfrac{3}{8}$ $q = \dfrac{1}{2}$	**2**	**B2** $p = \dfrac{9}{64}$ **and** $q = \dfrac{1}{4}$ or **B1** $p = \dfrac{3}{8}$ $q \neq \dfrac{1}{2}$
(b) $k = 6$	**2**	**M1** for a correct statement for k e.g. $\dfrac{5^{-3}+5^{-4}}{5^{-4}}$ or for the factorisation $5^{-4}(5+1) = k \times 5^{-4}$ or $\dfrac{1}{625}(5+1) = \dfrac{k}{625}$

9

Work out.
$$2^{-4} \times 2^{5}$$

.... [1]

MS-9

2		1	

10	Simplify.

(a) $(m^5)^2$

.... [1]

(b) $4x^3y \times 5x^2y$

.... [2]

11	

(a) $t^x \times t^2 = t^{10}$

Find the value of x.

$x = $ .... [1]

(b) Simplify.

(i) $\left(\dfrac{4}{x}\right)^{-2}$

.... [1]

(ii) $a^3b^7 \div a^6b^2$

.... [2]

MS-11	(a)	8	1	
	(b)(i)	$\dfrac{x^2}{16}$ final answer	1	
	(b)(ii)	$a^{-3}b^5$ or $\dfrac{b^5}{a^3}$ final answer	2	**B1** for $a^{-3}b^k$ or $a^k b^5$