(3) INDICES (Indeks)

(a) Table for Numbers Power of *n* (Jadual nombor kuasa)

n	−3	−2	−1	0	1	2	3	4	5	6	7
2	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	1	2	4	8	16	32	64	128
3	$\frac{1}{27}$	$\frac{1}{9}$	$\frac{1}{3}$	1	3	9	27	81	243	729	
5	$\frac{1}{125}$	$\frac{1}{25}$	$\frac{1}{5}$	1	5	25	125	625	3125		
6	$\frac{1}{216}$	$\frac{1}{36}$	$\frac{1}{6}$	1	6	36	216	1296			

$2 = 4^{\frac{1}{2}}$	$5 = 25^{\frac{1}{2}}$
$3 = 9^{\frac{1}{2}}$	$6 = 36^{\frac{1}{2}}$
$4 = 16^{\frac{1}{2}}$	$7 = 49^{\frac{1}{2}}$

(b) Indices and Law of Indices (Hukum Indeks)

- $a^n = a \times a \times \ldots\ldots\ldots \times a$ (n times of a) (n kali huruf a)
- $a^0 = 1$
- $a^{-n} = \frac{1}{a^n}$, $a^n = \frac{1}{a^{-n}}$,
- $\left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n$
- $a^{\frac{1}{n}} = \sqrt[n]{a}$

- $a^{\frac{m}{n}} = \left(\sqrt[n]{a}\right)^m = \sqrt[n]{a^m}$
- $a^m \times a^n = a^{m+n}$
- $a^m \div a^n = \frac{a^m}{a^n} = a^{m-n}$
- $(a^m)^n = (a^n)^m = a^{mn}$
- $a^n \times b^n = (ab)^n$, $\frac{a^n}{b^n} = \left(\frac{a}{b}\right)^n$

Example 1 :

$$\frac{k^4 \times k}{k^{-2}} = ???$$

$= k^{4+1-(-2)}$

$= k^{4+1+2}$

$= k^7$

Example 2 :

$(3f^5g)^2 \times (f^4)^{-3} \div f^{-2}g^7 = ???$

$= 9f^{10}g^2 \times f^{-12} \div f^{-2}g^7$

$= 9f^{10+(-12)-(-2)}\ g^{2-7}$

$= 9f^{10-12+2}\ g^{-5}$

$= 9f^0 g^{-5}$

$= 9g^{-5}$

Example 3 :

$3^{x-1} = 81$

$3^{x-1} = 3^4$

$x - 1 = 4$

$x = 4 + 1$

$x = 5$