

**Penang Sangam High School**

**P.O. Box 44, Rakiraki**

**Lesson Notes**

**Year 10**

**Mathematics**

**Strand:** Numbers

**Sub strand:** Rules of Indices and Problem

**Content Learning Outcome**

- Familiarise with the rules of indices using multiplication, division, exponential, zero and negative power.

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**Lesson Notes**

**Index Laws**

1.  $a^m \times a^n = a^{m+n}$

When multiplying numbers or variables having the same base, we add the index

2.  $a^m \div a^n = a^{m-n}$

When dividing numbers or variables having the same base, we subtract the index

3.  $(a^m)^n = a^{m \times n}$

When index form is raised to another power, the indices are multiplied.

4.  $a^0 = 1$

Any number or variable raised to power of zero is equal to 1

5.  $a^{-m} = \frac{1}{a^m}$

A negative index will give a fraction when simplified.

Examples	Activities
1. $2a^2 \times 5a$ $2 \times 5a^{2+1}$ $10a^3$	1. $3x^2 \times 5x$
2. $8p^2 \div 2p$ $\frac{8}{2}p^{2-1}$ $4p$	2. $6x^2 \div 3x$
3. $3 - (2x)^0$ $3 - 1$ $2$	3. $4 - (3m)^0$
4. $(3b^2)^2$ $3^2b^{2 \times 2}$ $9b^4$	4. $(4x^3)^2$
5. $2^{-3}$ is equivalent to $= \frac{1}{2^3}$ $= \frac{1}{8}$	5. $3^{-2}$ is equivalent to