**GRADE 11 LESSON 2- 10 -2- 21**

EXPONENTS

 exponent

$a^{b}$ **power**

 Base

Laws of exponents

1. Multiplication Law: $a^{m}×a^{n}=a^{m+n}$ [ when multiplying the powers with the

 same bases , we add the exponents]

1. Division Law: $a^{m}÷a^{n}=a^{m-n} $ [when we divide powers with the same bases

 we subtract the exponents]

1. Zero as an exponent: $a^{0}=1$ [ Any base with exponent zero with the

 exception of zero itself is 1]

1. Negative exponents: $a^{-1}=\frac{1}{a}$ [ If exponent becomes positive, the result

 becomes a reciprocal of the original]

 or $a^{-b}=\frac{1}{a^{b}}$

1. Raising to a power: $(a^{m})^{n}=a^{mn}$

Examples:

1. $2^{m}×2^{n}=2^{m+n}$ [Same bases $\rightarrow $ add exponents. ]
2. $x^{a}÷x^{b}=x^{a-b}$ [Same bases $\rightarrow $ subtract exponents]
3. $(2^{m})^{2}=2^{2m}$ or $4^{m}$
4. $(2^{m})^{-2}=2^{-2m}$ or $\frac{1}{2^{2m}}$ or $\frac{1}{4^{m}} $

**EXERCISE**

In your 2 quire homework book, attempt the following questions using the examples given above.

Simplify the following. Write the answers with **positive exponents**.

1. $2^{-x}$ 5. $x^{a}.x^{b}.x^{c}$
2. $x^{a}÷x^{b}$ 6. $(ab)^{x}$
3. $\left(2a^{2}\right)^{3}$ 7. $2\left(a^{2}\right)^{3}$
4. $\frac{2^{0}}{3}$ 8. $\left(\frac{2}{3}\right)^{0}$