Provincial Department of Education – Sabaragamuwa – Week School

Week : 23

Subject: Mathematics

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Grade -10

Grade 10 –Lesson 19 – Logarithm

Laws of indices

> **When multiplying powers with same base the indices are added.**
> example - $a^3 \times a^2 = a^5$
> **When dividing powers with same base the indices are subtracted**
> Example - $a^5 \div a^2 = a^3$
> **In power of a power indices are multiplied**
> Example- $(a^3)^2 = a^6$
> **The reciprocal is taken when converting negative indices to positive indices and positive indices to negative indices.**
> Example - $i) \frac{1}{a^{-2}} = a^2, \quad ii) a^3 = \frac{1}{a^{-3}}$
> The value of zero index to any base is 1
> $a^0 = 1$

Solve review exercise in page no 1 and 2
in Mathematics Part II

Logarithms

> **Writing in logarithm form when given in index form**
> Example - $2^3 = 8 \rightarrow \log_2 8 = 3$
> **Writing in index form when given in logarithm form**
> Example - $\log_3 81 = 4 \rightarrow 3^4 = 81$

Solve 19.1exercise in page no 4 in
Mathematics Part II

Lows of logarithms

$$\log_a(MN) = \log_a M + \log_a N$$

$$\log_a\left(\frac{M}{N}\right) = \log_a M - \log_a N$$

Example

I. $\log_2 5 + \log_2 8 = \log_2(5 \times 8) = \log_2 40$

II. $\log_a 8 + \log_a 6 - \log_a 2 = \log_a\left(\frac{8 \times 6}{2}\right) = \log_a 24$

III. $\log_{10} 250 + \log_{10} 8 - \log_{10} 2 = \log_{10}\left(\frac{250 \times 8}{2}\right) = \log_{10} 1003$

Solve 19.2 exercise in page no 8 in your exercise book