FIRST TERM E- LEARNING NOTE
SUBJECT: MATHEMATICS **CLASS: SS2**
SCHEME OF WORK

WEEK	TOPIC
1	Revision of Logarithm of Numbers Greater than One and Logarithm of Numbers Less than one; Reciprocal and Accuracy of Results Using Straight Calculation.
2	Approximations; Calculations Using Standard Form; Significant Figures; and Percentage Error.
3	Sequence and Series: Concept of Sequence and Series; Terms of Arithmetic Progressions and Sum ; Solving problem on A.P
4	Geometric Progressions: The nth Term and Sum of the First n-terms. Problem Solving on G.P and Geometric Mean.
5	Construction of Quadratic Equation from Sum and Product of Roots. Word Problem Leading to Quadratic Equation.
6	Review of the Half Term Work and Periodic Test.
7	Simultaneous Equations: Solving Simultaneous Equations Using Elimination and Substitution Method; Word Problem Leading to Simultaneous Equations.
8	Simultaneous Equations: Solving Equations Involving One Linear and One Quadratic; Using Graphical Method to Solve Quadratic Equations.
9	Straight Line Graphs: Gradient of a Straight Line; Gradient of a Curve; Drawing of Tangents to a Curve.
10	Revision.

REFERENCE BOOKS

- New General Mathematics SSS2 by M.F. Macrae etal.
- Essential Mathematics SSS2 by A.J.S. Oluwasanmi.

WEEK ONE

TOPIC: REVISION OF LOGARITHM OF NUMBERS GREATER THAN ONE AND LOGARITHM OF NUMBERS LESS THAN ONE.

CONTENT

- Standard forms
- Logarithm of numbers greater than one
- Multiplication and divisions of numbers greater than one using logarithm
- Using logarithm to solve problems with roots and powers (no > 1)
- Logarithm of numbers less than one.
- Multiplication and division of numbers less than one using logarithm
- Roots and powers of numbers less than one using logarithm

STANDARD FORMS

A way of expressing numbers in the form $A \times 10^x$ where $1 < A < 10$ and x is an integer, is said to be a standard form. Numbers are grouped into two. Large and small numbers. Numbers greater than or equal to 1 are called large numbers. In this case the x, which is the power of 10 is positive. On the other hand, numbers less than 1 are called small numbers. Here, the integer is negative.

Numbers such as 1000 can be converted to its power of ten in the form 10^x where x can be termed as the number of times the decimal point is shifted to the front of the first significant figure i.e. $10000 = 10^4$

Number	**Power of 10**
100	10^2
10	10^1
1	10^0
0.01	10^{-3}
0.10	10^{-1}

Note: One tenth; one hundredth, etc are expressed as negative powers of 10 because the decimal point is shifted to the right while that of whole numbers are shifted to the left to be after the first significant figure.

Examples

1. Express in standard form (i) 0.08356 (ii) 832.8 in standard form

Solution

i $0.08356 = 8.356 \times 10^{-2}$

ii $832.8 = 8.328 \times 10^2$

2. Express the following in standard form

(a) $39.32 = 3.932 \times 10^1$

(b) $4.83 = 4.83 \times 10^0$

(c) $0.005321 = 5.321 \times 10^{-3}$

WORKING IN STANDARD FORM

Example

Evaluate the following leaving your answer in standard form

(i) $4.72 \times 10^3 + 3.648 \times 10^3$

(ii) $6.142 \times 10^5 + 7.32 \times 10^4$

(iii) $7.113 \times 10^{-5} - 8.13 \times 10^{-6}$

solution

i. $4.72 \times 10^3 + 3.648 \times 10^3$

$= [4.72 + 3.648] \times 10^3$

$= 8.368 \times 10^3$

ii. $= 6.142 \times 10^5 + 7.32 \times 10^4$

$= 6.142 \times 10^5 + 0.732 \times 10^5$

$= [6.142 + 0.732] \times 10^5$

$= 6.874 \times 10^5$

iii. $= 7.113 \times 10^{-5} - 8.13 \times 10^{-6}$

$= 7.113 \times 10^{-5} - 0.813 \times 10^{-5}$

$= [7.113 - 0.813] \times 10^{-5}$

$= 6.3 \times 10^{-5}$

Example: Simplify : $\sqrt{[P/Q]}$, leaving your answer in standard form given that $P = 3.6 \times 10^{-3}$ and $Q = 4 \times 10^{-8}$.

Solution

$$= \sqrt{\left[\frac{3.6 \times 10^{-3}}{4 \times 10^{-8}}\right]}$$

$= \sqrt{\frac{36 \times 10^{-4}}{4 \times 10^{-8}}}$

$= \sqrt{9 \times 10^{-4-(-8)}}$

$= 3 \times (10^4)^{\frac{1}{2}}$

$= 3 \times 10^2$

EVALUATION

1. Evaluate $2.5 \times 10^{-3} + 3.2 \times 10^{-2}$
2. Without using table, evaluate the following leaving your answer in standard form,
   i. 4ab given that $a = 3.5 \times 10^{-3}$ and $b = 2.3 \times 10^6$ ii. $\frac{0.08 \times 0.000025}{0.0005}$

LOGARITHM OF NUMBERS GREATER THAN ONE

Base ten logarithm of a number is the power to which 10 is raised to give that number e.g.

$628000 = 6.28 \times 10^5$

$628000 = 10^{0.7980} \times 10^5$

$= 10^{0.7980+5}$

$= 10^{5.7980}$

Log 628000 = 5.7980

Integer Fraction (mantissa)

If a number is in its standard form, its power is its integer i.e. the integer of its logarithm e.g. log 7853 has integer 3 because $7853 = 7.853 \times 10^3$

Examples:

Use tables (log) to find the complete logarithm of the following numbers.

(a) 80030 (b) 8 (c) 135.80

Solution

(a) 80030 = 4.9033

(b) 8 = 0.9031

(c) 13580 = 2.1329

Evaluation

Use table to find the complete logarithm of the following:

(a) 183 (b) 89500 (c) 10.1300 (d) 7

Multiplication and Division of numbers greater than one using logarithm

To multiply and divide numbers using logarithms, first express the number as logarithm and then apply the addition and subtraction laws of indices to…