LOGARITHM

 $\log ab = \log a + \log b$ $\log \frac{a}{b} = \log a - \log b$ $\log a^{n} = n \log a$ $\log_{b} a = \frac{\log_{c} a}{\log_{c} b}$ $\log_{b} b = 1$ $\log_{b} b^{x} = x$ $\log_{b} 1 = 0$ $b^{\log_{b} x} = x$ $\operatorname{Ln x means} \log_{e} x$ $x = b^{\log_{b} x}$



FUNCTIONS

Domain: Set of real and finite values that the independent variable can take.

Range:Set of real and finite values that the dependent variable can have corresponding to the values of the independent variable

Co-Domain: Set of real and finite values that the dependent variable can have.

Concept: Range is a subset of Co-Domain. Co-domain may or may not have values which do not have a pre-image in the domain.

Concept: It is not a function if for some value in the domain, the relationship gives more than one value. Eg: f(x) = (At x = 4, f(x) could be both + 2 and - 2)

Concept: Domain cannot have any extra value i.e. the values at which the function does not exist.

OnetoOne: Every element in the Domain has one and only one image in the Co-Domain. Every element in Co- Domain has one and only one pre-image in the Domain.

ManytoOne: If at least two elements in Domain have the same image in the co-domain.**OntoFunction**: If for every element in the Co-Domain there is at least one pre-image in the Domain. In this case, Range = Co-Domain

IntoFunction: If there is at least one element in the Co- Domain which does not have a pre-image in the Domain. In this case, Range is a proper subset of Co-Domain.

EvenFunction: f(x) is even if and only if f(-x) = f(x) for all values of x. The graph of such a function is symmetric about the Y-Axis

Odd Function: f(x) is odd if and only if f(-x) = -f(x) for all values of x. The graph is symmetric about the origin

Concept: If f(x) is an odd function and f(0) exists f(0) = 0