**NOTE: This is an official document by Indexademics. Unless otherwise stated, this document may not be accredited to individuals or groups other than the club IDX, nor should this document be distributed, sold, or modified for personal use in any way.**

**IDX G9 MATH H+ STUDY GUIDE ISSUE 6**

**By Emma Li**

**3 Exponential and Logarithmic Functions**

**3.1 Powers and Exponents**

Properties (given )

-multiplication:

-division with the same base:

-division with the same power:

-power of a power with the same base:

-power of a power with the same power:

-negative one to a power:

-zero power:

-negative index:

-rational index:

If *n* is even, then . If *n* is odd, then .

Extended range of index to real numbers

For and , we still have

**3.2 Logarithms**

*N* is the logarithm of *y* to base *b*.

Definition

Special notations:

Law of Logarithms

For we have

-addition:

-difference:

Taking logarithms from both sides

Change of Base

Other properties

For

-

-

-

-

-

-

**4 Functions**

**4.1 Properties of Functions**

Operations

-sum:

-difference:

-product:

-quotient:

Composite Functions

-combining two functions by successive application

and is read “*f* of *g* of *x*”

-the domain of of the set of elements *x* in the domain of *g* such that is in the domain of *f*

Monotonicity

-let *f* be a function defined on an interval *I* and let and

-*f* is strictly increasing on

-*f* is strictly decreasing on

-*f* is increasing on

-*f* is decreasing on

Even and odd functions

For any

-*f* is an even function

-*f* is an odd function