1 Introduction

Mathematics Handout - Logaritmics

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Proof. Exp is continuous

$$x^l = A => log_x A = l$$

$$x^m = B => log_x B = m$$

$$x^n = A * B => log_x(A * B) = n$$

$$x^n = x^l * x^m$$

$$x^n = x^(l + m)$$

Given that power in bijective and onto *

$$n = l + m$$

$$log_x(A * B) = log_x A + log_x B$$

□

Proof. Logarithm Division Rule

$$x^l = A => log_x A = l$$

$$x^m = B => log_x B = m$$

$$x^n = A/B => log_x(A/B) = n$$

$$x^n = (x^l)/(x^m)$$

$$x^n = x^l * x^(- m)$$

Given that power in bijective and onto *

$$n = l - m$$

$$log_x(A/B) = log_x A - log_x B$$

□

Proof. Logarithm Division Rule

$$log_x A = B => x^B = A$$

First multiply the left side for c

$$C * (log_x A) = C * B$$

Now raise the right side to C

$$(x^B)^C = A^C$$

Given the Power rule

$$x^(B * C) = A^C$$

We can write this expression as log as

$$log_x(A^C) = B * C$$

Which give use

$$log_x(A^C) = C * (log_x A)$$

□