0.1 Logarithms

0.1.1 Logarithms

If:

$c = a^b$

Then

$log_a c = b$

Product rule:

$a = c^{log_c a}$

$b = c^{log_c b}$

So:

$ab = c^{log_c ab}$

But also:

$ab = c^{log_c a} c^{log_c b}$

$ab = c^{log_c a + log_c b}$

So:

$log_c a + log_c b = log_c ab$

0.1.2 Power rule

$a = b^{log_b a}$

So:

$a^c = b^{log_b a^c}$

And separately:

$a^c = (b^{log_b a})^c$

$a^c = (b^{c log_b a})$

So:

$c log_b a = log_b a^c$

0.2 Logarithms for natural numbers

0.3 Logarithms for integers

0.4 Logarithms for rational numbers