

Lecture 4

Friday, April 7, 2023 11:36 AM

* Questions . .

* Domain of functions involving logarithm and exponential function.

Recall : $\log_a x$ requires $x > 0$

a^x doesn't require any restriction on x

$\frac{a}{b}$ require $b \neq 0$

$x^{\frac{m}{n}}$ require $x \geq 0$ if n is an even number and m is an odd number

Ex Find the domain of

$$f(x) = \log\left(\frac{x-1}{x+1}\right) + e^{\frac{2}{2x+2}}$$

Ex Find the domain of

$$f(x) = \ln(4x-20) + \ln(x^2+9x+18)$$

Algebraic properties of logarithm

$$\log_a x + \log_a y = \log_a(xy)$$

$$\log_a(x^r) = r \log_a x$$

$$\log_a x - \log_a y = \log_a\left(\frac{x}{y}\right)$$

$$\log_a\left(\frac{1}{x}\right) = -\log_a x$$

$$\log_{\frac{1}{a}} x = -\log_a x$$

Ex Expand $\log \sqrt[3]{\frac{a^2 b}{cd}}$

Ex Combine into a single logarithm

$$\log x - \frac{1}{2} \log_{100} (x+1) + 2 \log y - 1$$