Class Discussion

Unit 3 Topic 2 Part 1 logarithmic functions

Definition of $\log_a x$ when $a \neq 1, a > 0, x > 0$ (This mathematical symbol read as "log based a of x")

Interpretation of $\log_a x = y$ ➔ solve an exponential equation of y if $a^y = x$

Ex1: Use the definition of logarithmic expression to evaluate

(a) $\log_{\sqrt{2}}\left(\frac{1}{2}\right)$

(b) $\log_{\frac{1}{8}}\sqrt{2}$

(c) $\log_{\sqrt{11}} 121$

(d) $\log_{16}\sqrt[3]{256}$

(e) $\log_{13}\left(\frac{1}{169}\right)$

Basic properties

(1) $\log_a 1 = 0$

(2) $\log_a\left(a^x\right) = a^{\log_a x} = x$

(3) $\log_a\left(\frac{1}{a}\right) = \log_{\frac{1}{a}} a = -1$

(4) if $\log_a x = \log_a y$ ➔ $x = y$

Ex 1 [ ] , find the implied domain.

Ex 2 Solve $\log_2 x = \log_2(2x+1)$

Ex 3 Evaluate $\log_{\sqrt{2}} 4 + \log_7\sqrt{343}$

Ex 4 Evaluate $\log_8 4 - \log_8 16$