

DEFINITION OF EXPONENTIAL FUNCTION TO BASE a

If a is a positive real number ($a \neq 1$) and x is any real number, then the **exponential function to the base a** is denoted by a^x and is defined by

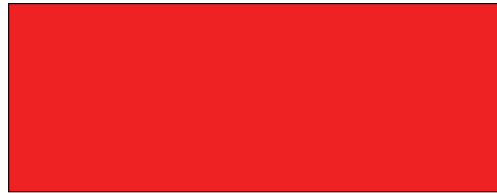
$$a^x = e^{(\ln a)x}.$$

If $a = 1$, then $y = 1^x = 1$ is a constant function.

DEFINITION OF LOGARITHMIC FUNCTION TO BASE a

If a is a positive real number ($a \neq 1$) and x is any positive real number, then the **logarithmic function to the base a** is denoted by $\log_a x$ and is defined as

$$\log_a x = \frac{1}{\ln a} \ln x.$$



Example: Bases Other than e

Find the derivative of the function $y = \log_2(x^2 \sin(x))$.

