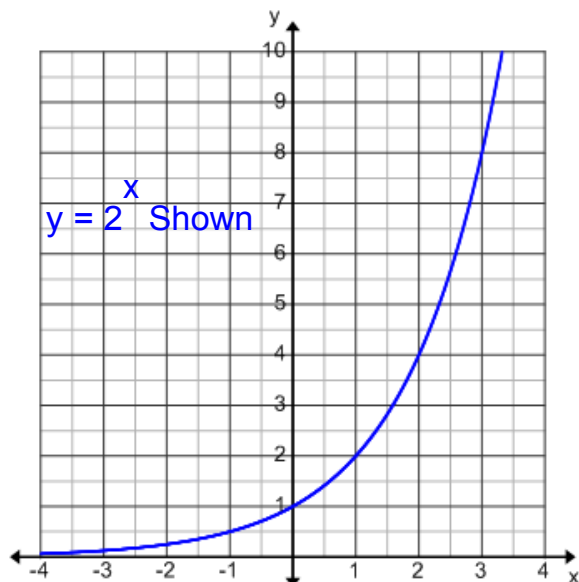


MHF 4UI UNIT 4 Exponential and Logarithmic Functions

Day 2 - Exponential Functions

BASIC EXPONENTIAL CURVE ($y=a^x$)

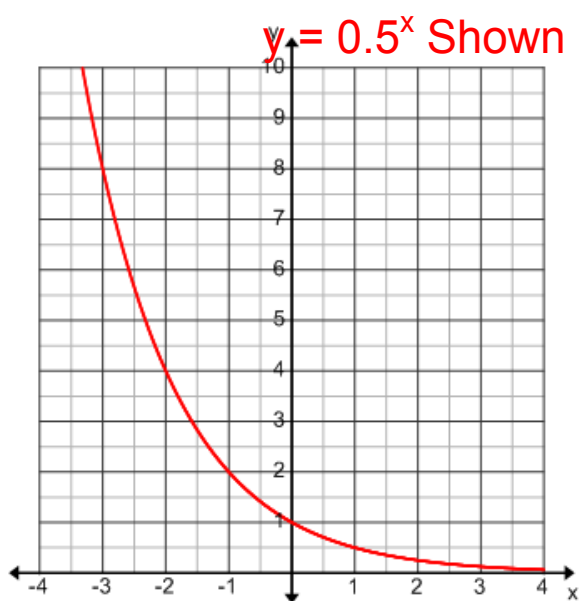
**WHOLE NUMBER BASE



$$\lim_{x \rightarrow \infty} =$$

$$\lim_{x \rightarrow -\infty} =$$

**FRACTIONAL BASE



$$\lim_{x \rightarrow -\infty} =$$

$$\lim_{x \rightarrow \infty} =$$

**** Base MUST BE POSITIVE!!!**

For example we can NOT PLOT $y = (-2)^x$

$$\begin{aligned}y &= (-2)^{-1} \\ &= \frac{1}{2}\end{aligned}$$

$$\begin{aligned}y &= (-2)^{\frac{1}{2}} \\ &= \sqrt{-2}\end{aligned}$$

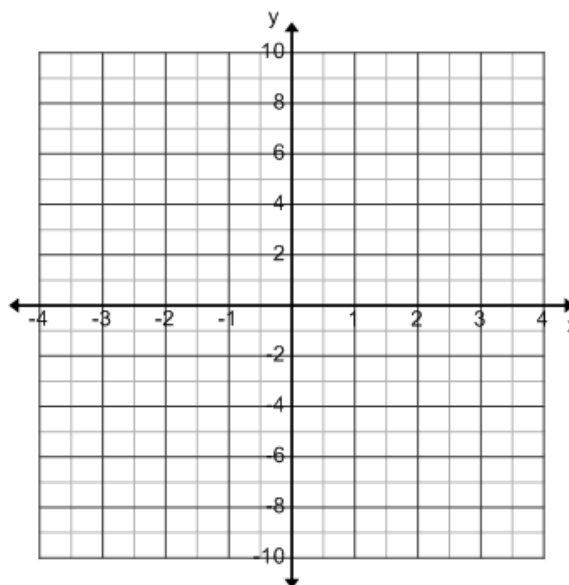
∴ We define Exponential Functions to be:

$$y = a^x \quad a \in (0, 1) \text{ and } a \in (1, \infty)$$

Transformations can also be applied to Exponential Functions

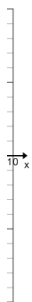
Example: Describe the transformations applied to the following function, then graph:

$$y = (-3)(2)^{x+1} + 5$$



Example 2: Evaluate each of the following limits:

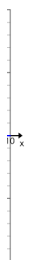
a) $\lim_{x \rightarrow \infty} 2^x$



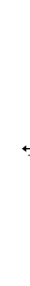
b) $\lim_{x \rightarrow \infty} 2^{3x-2}$



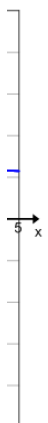
c) $\lim_{x \rightarrow \infty} 2^{-x}$



d) $\lim_{x \rightarrow -\infty} (3^x + 1)$



e) $\lim_{x \rightarrow 0^+} 2^{\frac{1}{x}}$



f) $\lim_{x \rightarrow 0^-} 2^{\frac{1}{x}}$

Attachments

TI Emulator Files.zip

Vti.exe