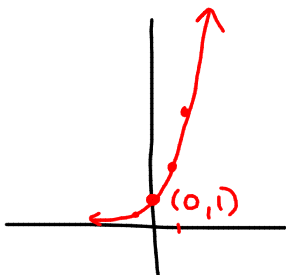


Limits of Exponential & Logarithmic functions :

$$f(x) = \underline{b^x} \quad \underline{b > 0}, \underline{b \neq 1}$$

$b > 1$
 $y = 2^x$



If $b > 1$
 $\lim_{x \rightarrow -\infty} b^x = 0$

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

$0 < b < 1$

$y = \left(\frac{1}{2}\right)^x$
 $= (2^{-1})^x$
 $= 2^{-x}$



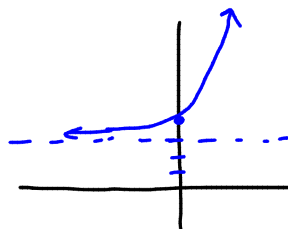
If $0 < b < 1$
 $\lim_{x \rightarrow -\infty} b^x = \infty$

$\lim_{x \rightarrow \infty} b^x = 0$

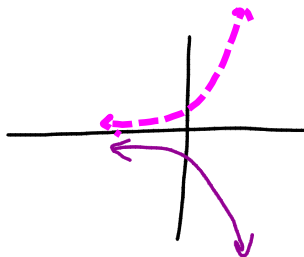
Ex: $\lim_{x \rightarrow -\infty} 2^x + 3 = 3$

$\lim_{x \rightarrow -\infty} 2^x + \lim_{x \rightarrow -\infty} 3 =$

$\downarrow \quad \downarrow$
 $0 + 3 = 3$



Ex: $\lim_{x \rightarrow \infty} -2^x = -\infty$

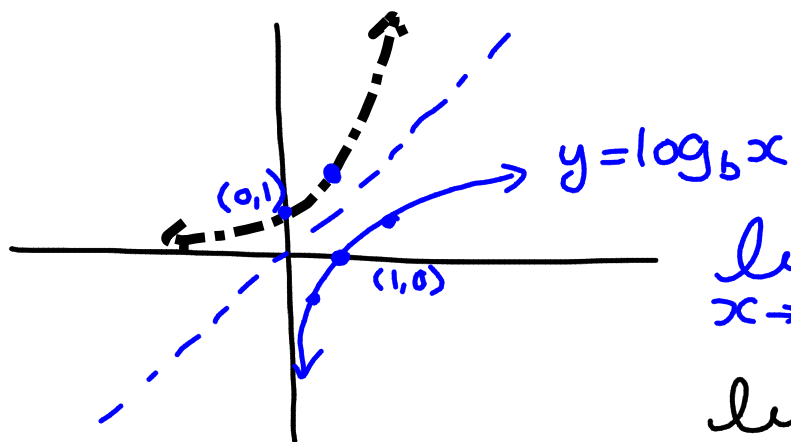


Ex: $\lim_{x \rightarrow 3^-} 2^{\frac{1}{x-3}} = 0$

x	$\frac{1}{x-3}$	$2^{\frac{1}{x-3}}$
2	-1	$2^{-1} = \frac{1}{2}$
2.5	-2	$2^{-2} = \frac{1}{4}$
2.9	-10	$2^{-10} = \frac{1}{1024}$

limits of logarithms (8.3)

$b^x = y$: The inverse is $b^y = x$
 which is: $\log_b x = y$



$$\lim_{x \rightarrow 0^+} \log_b x = -\infty$$

$$\lim_{x \rightarrow 0^+} \ln x = -\infty$$

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

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

C'est tout
 8.1 + 8.3