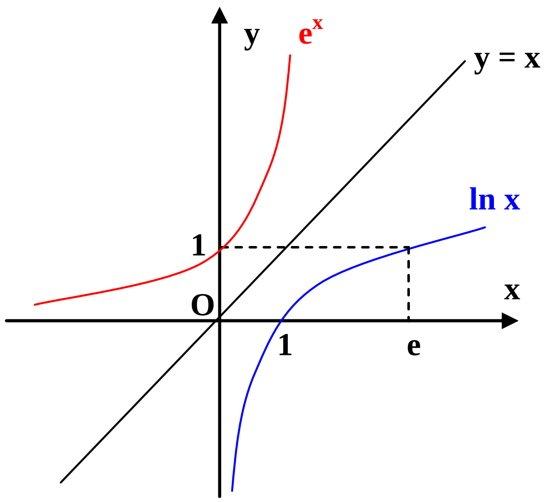
FONCTIONS LOGARITHME ET PUISSANCES

- Fonction ln : ln est définie sur $]0;+\infty[$



x	0		$+\infty$
$(\ln x)' = \frac{1}{x}$	||	$+$	
$\ln x$	|| $-\infty$	↗	$+\infty$

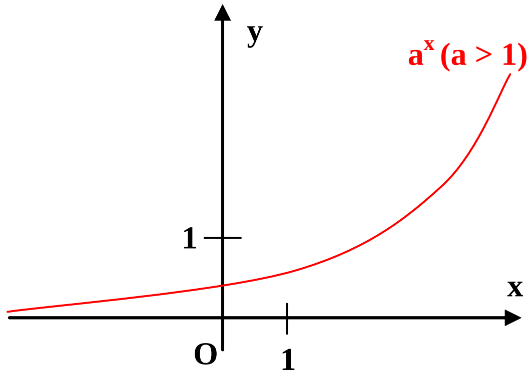
- Propriétés:

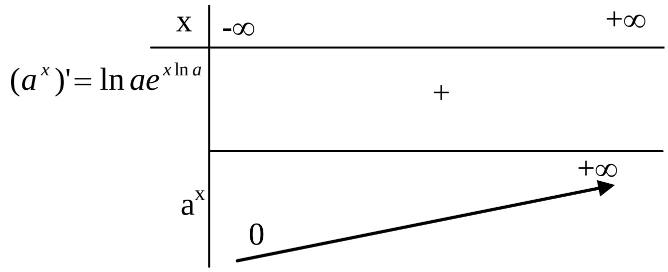
  - $\ln 1 = 0$; $\ln e = 1$; $\lim\limits_{+\infty} \ln x = +\infty$; $\lim\limits_{0^+} \ln x = -\infty$; $\lim\limits_{+\infty} \frac{\ln x}{x} = 0$
  - $\ln\left(\frac{a}{b}\right) = \ln a - \ln b$; $\ln(a \cdot b) = \ln a + \ln b$; $\ln(a^n) = n \ln a$; $\ln \sqrt{a} = \frac{1}{2} \ln a$
  - $\ln'(x) = (\ln x)' = \frac{1}{x}$; $(\ln u)' = \frac{u'}{u}$ et u et ln u ont même sens de variation

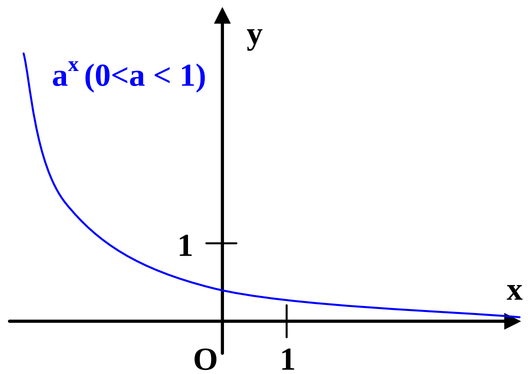
- Equations:

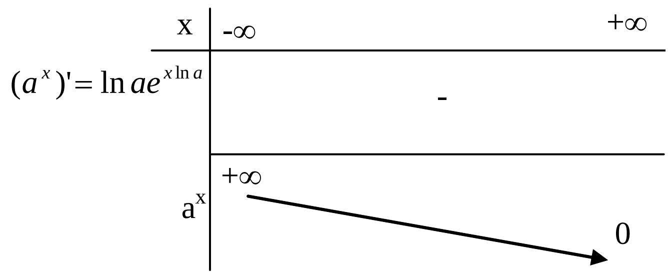
  - $\ln a = \ln b \Leftrightarrow a = b$
  - $\ln x = m \Leftrightarrow x = e^m$

- Fonctions puissances: $x \mapsto a^x = e^{x\ln a}$ est définie sur $\Re$ pour a > 0

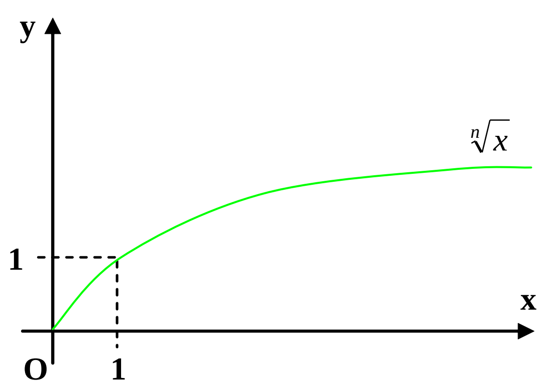


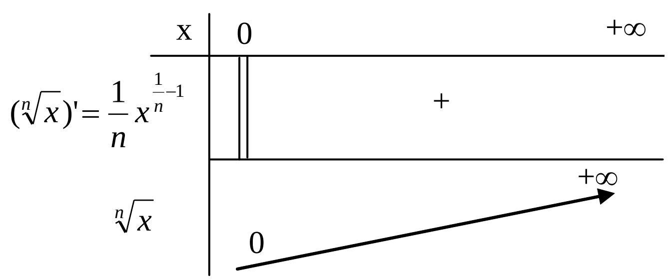






- Si α>0, alors : $\lim\limits_{x\to+\infty} \frac{e^x}{x^\alpha} = +\infty$, $\lim\limits_{x\to+\infty} x^\alpha e^{-x} = 0$, $\lim\limits_{x\to+\infty} \frac{\ln x}{x^\alpha} = 0$, $\lim\limits_{x\to 0} x^\alpha \ln x = 0$
- Fonction racine n-ième: $\sqrt[n]{x} = x^{\frac{1}{n}}$





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