

Ch1 Analyse

1.1 Exponentielles et logarithmes

Rappel : $\log_2(8) = 3 \Leftrightarrow 2^3 = 8$

$\log_a(u) = x \Leftrightarrow a^x = u$

base

argument

a et $u \in \mathbb{R}_+^*$
et $a \neq 1$

$$\log(u) = \log_{10}(u)$$

$$\ln(u) = \log_e(u)$$

Exemples : 1) $\log(100) = 2 \Leftrightarrow 10^2 = 100$

2) $\ln(e^5) = 5 \Leftrightarrow e^5 = e^5$

3) $\log_3(9) = 2$

4) $\log_9(3) = \frac{1}{2} \Leftrightarrow 9^{1/2} = \sqrt{9} = 3$

5) $\log_5\left(\frac{1}{25}\right) = -2 \Leftrightarrow 5^? = \frac{1}{25} = \frac{1}{5^2} = 5^{-2}$

~~$5^{1/5} = \sqrt[5]{5}$~~

Propriétés : 1) $\ln(e^x) = x$

2) $e^{\ln(x)} = x$

Exemples Résoudre

a) $7 + 3e^{x+1} = 14$

$$3e^{x+1} = 7$$

$$e^{x+1} = \frac{7}{3} \quad | \ln(\)$$

$$x+1 = \ln\left(\frac{7}{3}\right) \quad (\text{prop. 1.})$$

$$x = \ln\left(\frac{7}{3}\right) - 1 \approx -0,153 \quad \Rightarrow S = \left\{ \ln\left(\frac{7}{3}\right) - 1 \right\}$$

b) $5 + 3\ln(x+1) = 17$

$$3\ln(x+1) = 12$$

$$\ln(x+1) = 4 \quad | e^{(\)}$$

$$x+1 = e^4 \quad (\text{prop 2})$$

$$x = e^4 - 1 \approx 53,598$$

vérif : $5 + 3\ln(e^4 - 1 + 1) = 5 + 3\ln(e^4) = 5 + 3 \cdot 4 = 17 \checkmark$

$$\Rightarrow S = \{e^4 - 1\}$$