
Exercices - Logarithmes et exponentielles

■ Calculer

1) $\log_2(64) =$

2) $\log_{\frac{1}{3}}(27) =$

3) $\log_5(\sqrt{125}) =$

4) $\log_6\left(\frac{1}{\sqrt[3]{36}}\right) =$

5) $\log_{10}(0.0001) =$

6) $\log_{10}(1000) =$

7) $\log_{\frac{1}{7}}(49) =$

8) $\log_{16}\left(\frac{1}{4}\right) =$

9) $\ln\left(\frac{1}{e^5}\right) =$

10) $\ln\left(\frac{1}{\sqrt[3]{e}}\right) =$

11) $\ln(\sqrt{e}) =$

12) $\log_2(0.125) =$

■ Solutions

$$\log_2(64) = 6$$

$$\log_{\frac{1}{3}}(27) = -3$$

$$\log_5(\sqrt{125}) = \frac{3}{2}$$

$$\log_6\left(\frac{1}{\sqrt[3]{36}}\right) = -\frac{2}{3}$$

$$\log_{10}(0.0001) = -4.$$

$$\log_{10}(1000) = 3$$

$$\log_{\frac{1}{7}}(49) = -2$$

$$\log_{16}\left(\frac{1}{4}\right) = -\frac{1}{2}$$

$$\ln\left(\frac{1}{e^5}\right) = -5$$

$$\ln\left(\frac{1}{\sqrt[3]{e}}\right) = -\frac{1}{3}$$

$$\ln(\sqrt{e}) = \frac{1}{2}$$

$$\log_2(0.125) = -3.$$

■ Résoudre

$$1) -\frac{1}{9} + 3^{x-2} = 0$$

$$2) 16 - e^{2x} = 0$$

$$3) \log_x(27) = -3$$

$$4) \log_{10}(3x + 7) = 2 \log_{10}(5)$$

$$5) \ln(2x^2 + x) = 0$$

$$6) \ln(5x) - \ln(x+1) = \ln(2)$$

$$7) \ln(3-x) = \ln(x)$$

$$8) 2 \ln(x) - \ln(x-1) = 2 \ln(2)$$

$$9) \ln\left(\frac{x+3}{2}\right) = \frac{1}{2} (\ln(x) + \ln(3))$$

$$10) \log_2(x) = 2 \log_2(3) - \log_2(x-5) + 2$$

$$11) \log_{10}(x+3) + \log_{10}(x+5) = \log_{10}(15)$$

$$12) \ln(x-2) + \ln(x+2) - \ln(3) = \ln(15)$$

$$13) 2 \ln(x-4) = \ln(x) - 2 \ln(2)$$

$$14) \ln(x^2 + 5x + 6) = \ln(x + 11)$$

$$15) \log_3(4x+1) + \log_3(x+2) - 2 \log_3(3x) = 0$$

$$16) 2 \ln(1-x) - \ln(x+1) + \ln(2x+3) = 2 \ln(3)$$

$$17) \log_{10}(x^2 + 2x - 3) - 2 \log_{10}(x-1) = 2$$

$$18) \ln(x-1) + \ln(x) = \ln(x+3)$$

$$19) 3 \ln(x) - \ln(x+2) = \ln(2)$$

$$20) 15 - 11e^x + 2e^{2x} = 0$$

$$21) 6 + 4^x = 5 \cdot 2^x$$

$$22) \ln(x) (\ln(x) + 2) = -1$$

$$23) \ln(x) (3 \ln(x) + 5) = 2$$

$$24) 5^x < \frac{1}{2}$$

$$25) \log_8(x) \geq \frac{2}{3}$$

$$26) \log_{10}(6-x) > 1$$

$$27) -\frac{1}{e} + e^x \geq 0$$

$$28) \log_{\frac{1}{2}}(x+4) > \log_{\frac{1}{2}}(2x-3)$$

$$29) \ln(x^2+3) \geq \ln(x) + 2\ln(2)$$

$$30) 49^x \geq 7^{x-1}$$

$$31) -9 + e^{3x-1} > 0$$

$$32) 4 - 5 \cdot 2^x + 2^{2x} \leq 0$$

$$33) \frac{\ln(x)-1}{\ln(x)} \geq 1$$

$$34) \frac{\ln(x)-2}{\ln(x)} < 0$$

$$35) \frac{\ln(x)+1}{\ln(x)-1} < 0$$

■ Solutions

$$1) S = \{0\}$$

$$2) S = \{\ln(4)\}$$

$$3) S = \left\{\frac{1}{3}\right\}$$

$$4) S = \{6\}$$

$$5) S = \left\{-1, \frac{1}{2}\right\}$$

$$6) S = \left\{\frac{2}{3}\right\}$$

$$7) S = \left\{\frac{3}{2}\right\}$$

$$8) S = \{2\}$$

$$9) S = \{3\}$$

$$10) S = \{9\}$$

$$11) S = \{0\}$$

12) $S = \{7\}$

13) $S = \left\{ \frac{1}{8} (33 + \sqrt{65}) \right\}$

14) $S = \{-5, 1\}$

15) $S = \{2\}$

16) $S = \left\{ -\frac{1}{2} \right\}$

17) $S = \left\{ \frac{103}{99} \right\}$

18) $S = \{3\}$

19) $S = \{2\}$

20) $S = \left\{ \ln\left(\frac{5}{2}\right), \ln(3) \right\}$

21) $S = \left\{ 1, \frac{\ln(3)}{\ln(2)} \right\}$

22) $S = \left\{ \frac{1}{e} \right\}$

23) $S = \left\{ \frac{1}{e^2}, \sqrt[3]{e} \right\}$

24) $S = \leftarrow, -\frac{\ln(2)}{\ln(5)} [$

25) $S = [4, \rightarrow$

26) $S = \leftarrow, -4 [$

27) $S = [-1, \rightarrow$

28) $S =] 7, \rightarrow$

29) $S =] 0, 1] \cup [3, \rightarrow$

30) $S = [-1, \rightarrow$

31) $S =] \frac{1}{3} (1 + \ln(9)), \rightarrow$

$$32) S = \left[0, \frac{\ln(4)}{\ln(2)} \right]$$

$$33) S =] 0, 1 [$$

$$34) S =] 1, e^2 [$$

$$35) S = \left] \frac{1}{e}, e \right[$$