Esercizi sui logaritmi

Risolvi le seguenti equazioni esponenziali :

$3^x = 81$ $2^x = 8$ $\left(\frac{1}{2}\right)^x = \frac{1}{4}$ $2^x = \frac{1}{32}$ $2^x = \frac{1}{8}$ $\left(\frac{1}{2}\right)^x = 8$ $2^x = 1$ $8^x = 2$ $8^x = 4$

$\left(\frac{3}{5}\right)^x = \frac{125}{27}$ $\left(\frac{9}{4}\right)^x = \frac{8}{27}$ $10^x = 10000$ $10^x = 0{,}0001$ $2^{x-2} = 8$ $4^{3x-2} = 8^{x-1}$ $\left(2^{x-1}\right)^2 = 4$

$8 \cdot 2^x = \frac{1}{4}$ $\left(\frac{3}{2}\right)^{x-1} = \left(\frac{4}{9}\right)^{x+1}$ $\sqrt{3^x} = 9$ $12^{2x} = 2\sqrt{3}$ $9 \cdot 3^x = \frac{1}{9}$ $2^{5x-2} = \frac{1}{8}$ $2^{\sqrt{x}} = 64$

$4^{\sqrt{x-2}} = 16$ $4^{2x-1} = 1024$ $0{,}04^{x-1} = 25^{3-2x}$ $2^{3x} = \frac{8}{2^{x+2}}$ $2^{x-3} \cdot 2^{2x+4} = 4$ $2^{x-3} \cdot 4^{x+1} = 8$

Determina i valori dei seguenti logaritmi :

$\log_2 16$ $\log_3 27$ $\log_{\frac{1}{2}} \frac{1}{8}$ $\log_{\frac{1}{3}} 9$ $\log_{\frac{1}{2}} \frac{1}{8}$ $\log_5 125$ $\log_{\frac{1}{5}} \frac{1}{25}$ $\log_5 \frac{1}{25}$ $\log_{\frac{2}{3}} \frac{4}{9}$

$\log_{\frac{3}{2}} \frac{27}{8}$ $\log_{\frac{9}{4}} \frac{8}{27}$ $\log_2 0{,}125$ $\log_{10} 1000$ $\log_{10} 0{,}001$ $\log_{100} 0.001$ $\log_2 \sqrt{8}$

$\log_4 \sqrt[5]{8}$ $\log_{\sqrt[3]{4}} \sqrt[5]{8}$ $\log_4 \frac{1}{\sqrt[5]{4}}$ $\log_{0,25} \sqrt[4]{8}$ $\log_{10} \sqrt[5]{100}$ $\log_{100} \sqrt[3]{10000}$ $\log_{0.01} \sqrt[4]{1000}$

Determina le basi dei seguenti logaritmi :

$\log_x 16 = 4$ $\log_x 4 = -2$ $\log_x \frac{1}{32} = -5$ $\log_x \frac{9}{4} = 2$ $\log_x 3 = \frac{1}{2}$ $\log_x 2 = \frac{1}{3}$ $\log_x 3 = -\frac{1}{3}$

Trova i seguenti antilogaritmi :

$\log_3 x = 2$ $\log_4 x = -2$ $\log_4 x = \frac{1}{2}$ $\log_2 x = -\frac{1}{2}$ $\log_8 x = \frac{1}{3}$ $\log_4 x = -\frac{1}{2}$ $\log_{\frac{2}{5}} x = -3$

Applicando i teoremi sui logaritmi, trasforma le seguenti espressioni in somme algebriche di logaritmi :

$\log 6xyz$ $\log \frac{xy}{6z}$ $\log \frac{xy}{x+z}$ $\log \frac{xy}{xz+3}$ $\log x^4 y z^3$ $\log \frac{x^4 y}{z^5}$ $\log \frac{x^5 y^3}{x+z^2}$ $\log \sqrt[3]{x}$

$\log \sqrt[5]{xy^2 z^7}$ $\log \sqrt[5]{\frac{x+y^3}{3y^4}}$ $\log \sqrt[7]{4\sqrt[3]{\frac{x^2 y}{5z}}}$ $\log \frac{\sqrt[5]{3xy^4}}{4\sqrt{ab^3}}$ $\log x^3 \cdot \sqrt[7]{\frac{xy^3}{3x+y}}$ $\log \sqrt[7]{a\sqrt{b^3 \cdot \sqrt[5]{c^2}}}$

Calcola il valore delle seguenti espressioni :

$\log_2 \sqrt[5]{8 \cdot \sqrt[3]{2}}$ $\log_3 9 \cdot \sqrt[3]{81\sqrt[5]{27}}$ $\log_4 \sqrt[5]{2 \cdot \sqrt[3]{4\sqrt{2}}}$ $\log_2 \sqrt[3]{4 \cdot \sqrt[5]{2 \cdot \sqrt{2}}}$ $\log_{\frac{1}{2}} \frac{1}{4} \cdot \sqrt[3]{16}$

$\log_a a^2 \cdot \sqrt[3]{\frac{a^2}{\sqrt{a}}}$ $\log_2 \sqrt[5]{8 \cdot \sqrt[3]{2}}$ $\log_3 9 \cdot \sqrt[3]{81 \cdot \sqrt[5]{27}}$ $\log_4 \sqrt[5]{2 \cdot \sqrt[3]{4 \cdot \sqrt{2}}}$ $\log_a a^2 \cdot \sqrt[3]{\frac{a^2}{\sqrt{a}}}$

Applicando i teoremi sui logaritmi, riduci ad un unico logaritmo le seguenti espressioni :

$\log a + \log b$ $\log a + \log b - \log c$ $\log a^3 + \log b - \log c^2$ $\log a + \frac{1}{3}\log b - \log c$ $\frac{1}{5}\left(\log a + \log b\right)$

$\frac{1}{2}\log(a-b) - \frac{1}{2}\log(a+b) + 2\log a - 2\log b$ $\frac{2}{3}\log(a+2) - \frac{1}{2}\log(a-1) + 2\log a - 3\log 2$

Calcolare i logaritmi decimali dei seguenti numeri (con meno di 5 cifre significative):

Log 543 Log 543 Log 5430 Log 0,543 Log 0,0000543 Log 54,3 Log 5,43 Log 543,000 Log 3,7

Log 0,008346 Log 30,06 Log 235600 Log 92,13 0,8073 Log 106,2 Log 0,06837 Log 0,12

Log 6,006 Log 64,58 Log 0,0396 Log 843,6 Log 17 Log 3459 Log 0,5632 Log 0,000433 Log 4

Calcolare i logaritmi decimali dei seguenti numeri (con più di 4 cifre significative):

Log 57185 Log 57,185 Log 0,57185 Log 5,7185 Log 0,00057185 Log 76,956 Log 453,58

Log 3,55367 Log 58,4632 Log 0,0500432 Log 31,8645 Log 42445,5 Log 3,00045 Log 2,43034

Log 6,0065 Log 64,583 Log 0,039644 Log 843,635 Log 174356 Log 345429 Log 0,563224

Calcolare i seguenti antilogaritmi (che si trovano sulle tavole) :

Log x = 2,12483 Log x = 0,12483 Log x = 1,12483 Log $\overline{1}$,73175 Log x = 2,11926 Log x = 0,30038

Log x = $\overline{2}$,38703 Log x = $\overline{3}$,46953 Log x = 0,70010 Log x = 0,00604 Log x = 0,04999

Log x = 1,41296 Log x = 0, 81245 Log x = $\overline{2}$,76589 Log x = $\overline{1}$,61098 Log x = $\overline{3}$, 00087

Calcolare i seguenti antilogaritmi (che non si trovano sulle tavole) :

Log x = 2,12485 Log x = 0,12485 Log x = 1,12485 Log $\overline{1}$,73177 Log x = 2,11945 Log x = 0,30051

Log x = $\overline{2}$,38712 Log x = $\overline{3}$,46957 Log x = 0,70014 Log x = 0,006027 Log x = 0,05020

Log x = 1,41307 Log x = 0, 81249 Log x = $\overline{2}$,76593 Log x = $\overline{1}$,61101 Log x = $\overline{3}$, 00117

Effettuare i seguenti calcoli con i logaritmi :

$1{,}83 \cdot 97{,}13$ $0{,}83957 \cdot 940{,}05 \cdot 0{,}03$ $8{,}1643 \cdot 0{,}092136 \cdot 2{,}14235 \cdot 0{,}016348$ $0{,}07 \cdot 45{,}3^5$

$42{,}78 \cdot 0{,}65^5$ $0{,}17845^4$ $0{,}132165^4$ $2{,}81^7$ $0{,}986542^{15}$ $0{,}4326^3$ $0{,}91864^{10}$

$\text{Log } 1{,}2 \cdot 10^{-2}$ $\text{Log } 3{,}8 \cdot 10^{15}$ $-\text{Log } 0{,}97 \cdot 10^{-4}$ $-\text{Log } 71{,}2 \cdot 10^{-3}$ $-\text{Log } 2{,}28 \cdot 10^{-6}$

$\sqrt[3]{12}$ $\sqrt[3]{267}$ $\sqrt[3]{5{,}8}$ $\sqrt[4]{12}$ $\sqrt[5]{267}$ $\sqrt[7]{5{,}8}$ $\sqrt[5]{0{,}5672}$ $\sqrt[12]{267}$ $\sqrt[9]{82{,}67}$ $\sqrt[13]{5{,}8}$

$\sqrt{1{,}3 \cdot 10^{-3}}$ $\sqrt{5{,}7 \cdot 10^{-5}}$ $\sqrt[3]{3{,}654 \cdot 10^{-5}}$ $\sqrt[4]{0{,}5435 \cdot 10^{-5}}$ $\sqrt[5]{\frac{13}{16}}$ $\sqrt[7]{\frac{12{,}3}{3{,}16}}$