Answer on Question #71854 – Math – Algebra

Question

Write $\left(\frac{1}{2}\right)^2$ as base $\frac{1}{3}$ power.

Solution

First of all let us note that $\left(\frac{1}{2}\right)^2 = \frac{1}{4}$. So we must solve the equation

$$\left(\frac{1}{3}\right)^x = \frac{1}{4}.$$

Then

$$x = \log_{\frac{1}{3}} \frac{1}{4} = \frac{\ln \frac{1}{4}}{\ln \frac{1}{3}} = \frac{-\ln 4}{-\ln 3} = \frac{\ln 4}{\ln 3}$$

(see http://www.purplemath.com/modules/solvexpo2.htm and

http://dl.uncw.edu/digilib/mathematics/algebra/mat111hb/eandl/logprop/logprop.html).

So

$$\left(\frac{1}{2}\right)^2 = \frac{1}{4} = \left(\frac{1}{3}\right)^{\frac{\ln 4}{\ln 3}}.$$

Answer: $\left(\frac{1}{2}\right)^2 = \left(\frac{1}{3}\right)^{\frac{\ln 4}{\ln 3}}$.

Answer provided by https://www.AssignmentExpert.com