

Find the solution of the equation $3^{4x+2} = 25$.

- We must try to get x by itself. So, we take the natural log of both sides.

$$\ln(3^{4x+2}) = \ln(25)$$

- Since $\ln(a^b) = b \ln a$,

(The log of a number to an exponent is the exponent times the log of the number.)

we get $(4x+2)\ln 3 = \ln 25$.

- Then $4x\ln 3 + 2\ln 3 = \ln 25$

$$4x\ln 3 = \ln 25 - 2\ln 3$$

- Hence, $4x = \frac{\ln 25 - 2\ln 3}{\ln 3}$

$$x = \frac{\ln 25 - 2\ln 3}{4\ln 3} , \quad x = .23$$