

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

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