Find the common difference and the 57^{th} term of the arithmetic sequence
4, 9, 14, 19, ...

- Recall that for any arithmetic sequence $a, a+d, a+2d, a+3d, \ldots$
  the n-th term is

  $a + (n-1)d$ where a is the first term and d is the common difference.

- For the arithmetic sequence 4, 9, 14, 19, ... $a=4$ and $d=5$.

- So the 57^{th} term is

$$4 + (57-1)5 = 284$$

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.

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

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

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

$$x = \frac{\ln 25 - 2\ln 3}{4\ln 3}$$, $x = .28$