Unit n°117 continuation 1

e, fib(i), Φ, and more

117c1.1

Analyze the sequence $\langle g(i,m) \rangle_{i=0}^{\infty}$ with

$$** \; g(i,m) = \frac{\left(\frac{fib(i+3)}{fib(i+2)}\right)^{m+2} - \left(\frac{fib(i+2)}{fib(i+1)}\right)^{m+1}}{\left(\frac{fib(i+2)}{fib(i+1)}\right)^{m+1} + \left(\frac{fib(i+1)}{fib(i)}\right)^{m}} \; .$$

Expand

$$** \; g(n,m) = \frac{\left(\frac{fib(n+3)}{fib(n+2)}\right)^{m+2} - \left(\frac{fib(n+2)}{fib(n+1)}\right)^{m+1}}{\left(\frac{fib(n+2)}{fib(n+1)}\right)^{m+1} + \left(\frac{fib(n+1)}{fib(n)}\right)^{m}}$$

in a simple continued fraction.

Link to Unit 30.1.1.