

Let $F(0) = 0$, $F(1) = \frac{3}{2}$, and $F(n) = \frac{5}{2}F(n-1) - F(n-2)$ for $n \geq 2$.

Determine whether or not $\sum_{n=0}^{\infty} \frac{1}{F(2^n)}$ is a rational number.