

**Problem 11258** Let  $F_n$  denote the  $n$ th Fibonacci number. Prove that

$$\sum_{k=0}^{\infty} \frac{F_{3^k} - 2F_{3^k+1}}{F_{3^k} + iF_{2 \cdot 3^k}} = i + \frac{1}{2}(1 - \sqrt{5}),$$

where  $i = \sqrt{-1}$ .