

6. A sequence of numbers is defined by

$$u_1 = 1 \qquad u_2 = 5$$

$$u_{n+2} = 5u_{n+1} - 6u_n \qquad n \geq 1$$

Prove by induction that, for $n \in \mathbb{Z}^+$

$$u_n = 3^n - 2^n$$

(6)