ER2. Let $\{x_n\}_{n=0}^{\infty}$ be the recursively defined sequence of integers defined by

$$x_1 = 2 \quad , \quad x_2 = 4 \quad , \quad x_3 = 8$$

and

$$x_{n+3} = x_{n+2} + x_{n+1} + 2x_n \quad \text{when } n \in \mathbb{N}. \tag{RD}$$

Using math induction, prove that $x_n = 2^n$ for each $n \in \mathbb{N}$.

. . . . . .

DELETE this whole sentence and THEN put your answer to ALL parts down here.