SUBJECT 3

On January 2nd 2012, one-year-old Angela's parents opened a ***savings account*** for her with an initial deposit of six hundred euros.
Thereafter, every January 2nd, Angela's account will be credited with two and a half percent interest on the previous year's capital.
Moreover, on the same day, Angela's parents will transfer four hundred euros from her main account to her savings account.
For any whole number n, let u_n be the capital (in euros) in Angela's savings account on the evening of January 2nd $(2011 + n)$. Thus: $u_1 = 600$.

1. Write the recurrence relation describing the evolution of the sequence (u_n).

Let (v_n) be a new sequence defined, for any whole number n, by: $v_n = u_n + 16\ 000$.
It can be proven that (v_n) is a geometric sequence with common ratio q equal to 1.025.

2. Compute v_1 and express v_n in terms of n.

3. Deduce the expression of u_n in terms of n.

4. On the evening of January 2nd 2023, how old will Angela be?
   What capital will she own by then? The result shall be rounded up to the nearest cent.

Nota:
savings account : livret d'épargne