Problem of the Month

Problem 5: Stabilising Sequences

February 2026

Hint

1. First compute $a_0^{(1)}$ and $a_1^{(1)}$, and use this to compute a_2. Can you then compute a_3?
2. Start by computing a_0, a_1, a_2, a_3, a_4, and a_5. Use these to compute the first few terms of the next layer (i.e., the terms $a_0^{(1)}, a_1^{(2)}, \ldots$). Then compute the first few terms of the next layer, and then the next layer. Keep going until you think you've reached the layer at which the sequence stabilises.
3. Try some specific examples of sequences like this. You already did one in Question 2. Try $a_n = n^2 + 3n + 2$ and $a_n = n^3 - n$. Explicitly compute expressions for the next few layers and pay attention to the degree of the polynomial that emerges at each layer.
4. Use Question 3 to guess at a general form for a_n.