Solution (#259) Define

$$A_n = 3 \times 2^{2n} + 2 \times 3^{2n}$$

and show that

$$A_{k+1} - 4A_k = 10 \times 3^{2k}.$$

The expression $A_{k+1} - 4A_k$ was chosen expressly so that one of the powers cancelled, in this case the powers of 2.