



STEP II, 2017, Q2 EC

This was the second most popular question of all, attempted by over 80% of candidates; but scoring relatively poorly with a mean score of under 10. It was, of course, heavily algebraic and this meant that many candidates found it challenging, getting lost in the algebra. In most cases, this was largely avoidable: the simple device of calling the first term “ X ” (say) would have prevented a lot of unnecessary subscripts from cluttering up the working. A few moments of thought from those candidates who simply embarked on the (potentially) intricate algebra could have saved a lot of trouble. The point of a sequence’s periodicity is that it is the smallest cycle over which terms repeat; it should be noted that the condition for each term to be equal (a constant sequence) must clearly be embedded in any condition that gives $x_{n+2} = x_n$. Similarly, in order to satisfy $x_{n+4} = x_n$, we must automatically have the cases when all terms are the same *and* every other term equal present somewhere. This makes any ensuing factorisations much easier to deal with.

It could be noted that the requirement for $x_{n+4} = x_n$ can be thought of as a two-stage sequence using every other term; and this situation has just been sorted out.



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