FINISHING UP SUCCESSIVE DIFFERENCES

BEGINNER CIRCLE 4/17/2016

Problem 1. Let S be the sequence of square numbers. Prove that $dS = O$, where O is the sequence of odd numbers.

Problem 2. We've noticed that with the triangular numbers T, that $dddT = 0$, and with the square numbers, $dddS = 0$ (Where 0 means the sequence of all zeroes.) Prove that the sequence of square numbers S have the property that

$$d^3 = dddS = 0.$$

Jeff Hicks/Los Angeles Math Circle/UCLA Department of Mathematics .

Problem 3. Can you find a (non-zero) sequence such that $dF = F$?

Problem 4. Can you find a (non-zero) sequence where $ddF = F$?

Problem 5. Find a (non-zero) sequence that has the property that
$dF = F$ with all the numbers shifted to the right by one place