



Problem
201

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Problem #133 (in the February 2007 issue) introduces the concept of Single Digit Quality, or SDQ.

Review: *We can immediately find the single digit quality for every positive number by adding the digits in that number until a single digit is obtained. To indicate that we are reducing a number to its single digit quality we write it as: $137 \Rightarrow 11 \Rightarrow 2$. Thus, the SDQ of 137 is 2.*

In problem #171 (October 2008) the Fibonacci Series was first examined, a recursive sequence where each term or number is the sum of its *two* preceding numbers.

In the next series of problems we will examine new concepts of SDQ and Fibonacci.

The regular Fibonacci series is given by:

1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610, 987, 1,597, 2,584, 4,181, 6,765, 10,946, 17,711, 28,657, 46,368; 75,025, 121,393, 196,418... , where each new number is the sum of the two preceding numbers.

- a) Write the first 17 terms of the square of each Fibonacci number.
- b) What is the significance of, say, the 13th term divided by its preceding term?
By its following term?
- c) Now write the SDQ of each of these Fibonacci Square numbers. Is there a quicker method to finding the SDQ of the Square Fibonacci series?
- d) Does this yield a repeating series as did the SDQ of the Regular Fibonacci numbers?
- e) If so, what is this repeating series?
- f) What stands out in the number of different digits in the SDQ Fibonacci Square series?