The solution by William D. Jackson alluded to shows:

The number of Fibonacci numbers not greater than \( N \) is the greatest integer less than

\[
\log \left( \frac{(N + \frac{1}{2}) \sqrt{5}}{\frac{1 + \sqrt{5}}{2}} \right) - 1.
\]

A FIBONACCI CROSSWORD PUZZLE

H.W. Gould
West Virginia University
ACROSS

2 A kind of number discovered by 17 Down of 22 Down while studying 50 Across.
8 Series (French).
9 A river in Kansas and Missouri.
12 Smallest number into which each of two numbers will divide.
14 The smallest natural number (French).
15 One more than a perfect square.
16 Occurrence of Fibonacci numbers in nature.
20 \[
\lim_{n \to \infty} (1 + 1/n)^n.
\]
21 Device sometimes used to generate random numbers.
23 Combining form of "Chinese".
26 Letter used to denote a famous number sequence.
27 Sign of differentiation.
28 Brother of Abel.
29 Iron.
31 The numbers 1, 3, 4, 7, 11, ... are ____ numbers.
32 Girl's name.
33 Measure of intelligence (they say).
35 Chemical element.
36 \[F_{n+1} = F_n + F_{n-1}\] is an example.
39 Roman emperor.
40 \[(e^x + e^{-x})/2.\]
43 Amateur.
44 Latin connective.
45 Utilizes.
46 Square root of minus one.
47 If \(n\) is a natural number, then \(n+1\) is the ____ natural number.
49 Bitter Vetch.
50 Studied in 1202 AD by 2 Across.
51 Throws out.
1. The first degree.
2. Battle.
3. Famous mathematician who wrote novels under the nom de plume John Taine.
4. Definite article (Arabic).
5. Cone-shaped.
6. A form of the copula.
7. Base of the decimal system.
8. Preposition.
9. The function \(x(1 - x - x^2)^{-1}\) is\(\ldots\) the Fibonacci numbers.
10. In fact, a Fibonacci number is the ______ of \(x^n\) in the power series expansion of \(x(1 - x - x^2)^{-1}\).
11. Discovered a famous triangle named after him. Known earlier to the Chinese.
12. Another name of 2 Across.
13. One of the simplest ways to combine numbers.
14. The numbers 1, 1, 2, 3, 5, 8, \ldots form a ______.
15. A town in Italy.
17. A famous game whose theory is based on the binary system.
18. What one usually does with 13 Down in order to discover a relation.
21. Abbreviation for a trigonometrical function; counterpart of 41 Across.
22. Man's nickname.
24. To make a sharp sibilant sound.
25. Black substance obtained from coal.
26. An Indian of the Shoshonean tribes.
27. The Unknown Quantity.

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**1966 ADVANCED PROBLEMS AND SOLUTIONS**

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