YOUR LETTERS

Dear Sir,

I have been doing some work on the n'th prime number, but was impeded for some time because of the lack of prime numbers. However, I have found some pattern in the prime numbers, but because of limited experience am unable to draw any conclusions.

My reasoning is as follows.

(1) Plot n against the n'th prime number and you get an *approximate* parabola.

(2) From this it can be seen that n to the power of some constant k equals approximately the n'th prime number.

i.e. $n^k \cong$ n'th prime number.

(3) Proceed to find k for the prime numbers and plot n against k (see graph).

The graph appears to be approaching some limit. Obviously k can never reach one (1), but k for the 665,000th prime number is 1.202. One would tend to think that the limit is somewhat above 1 (possibly 1.2?).

Patricia Saccasan,
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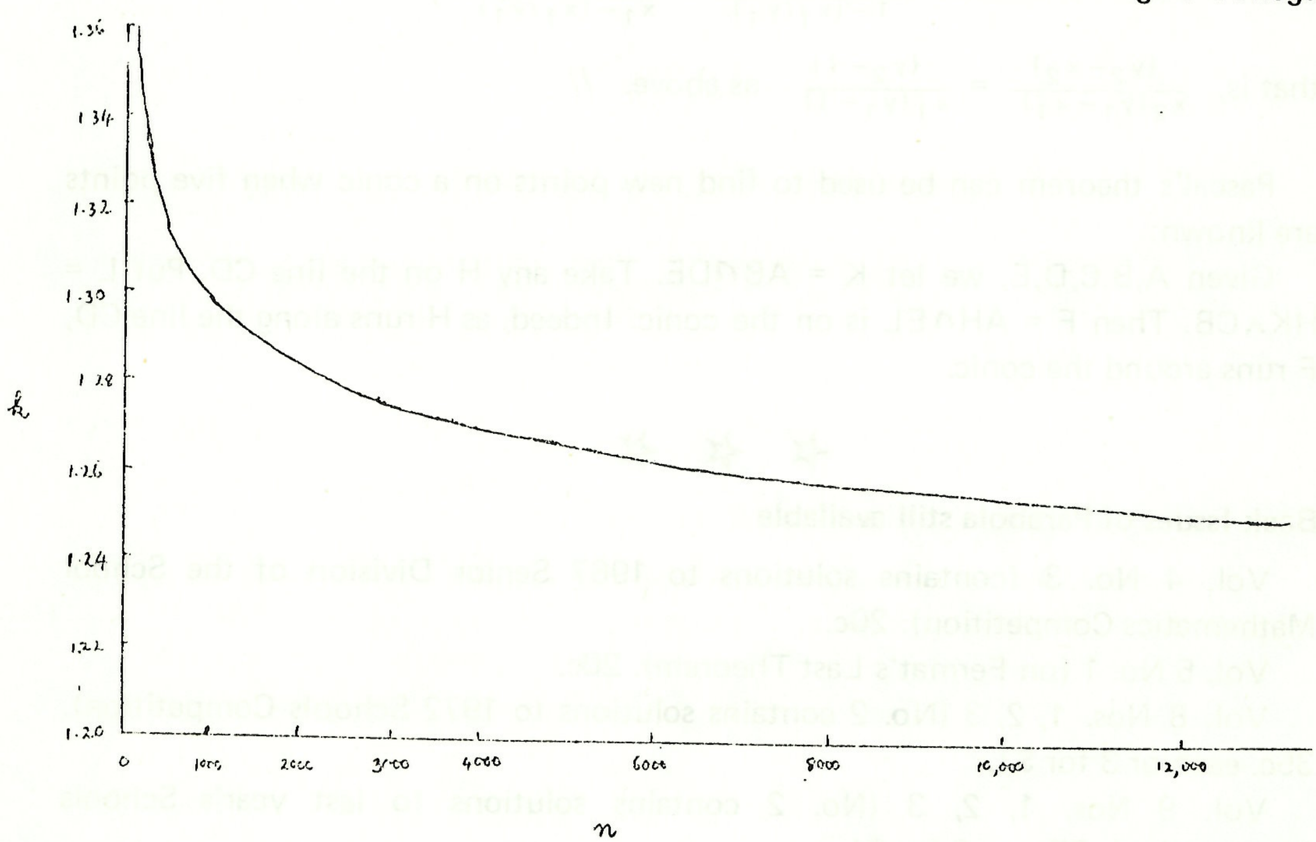

Dear Sir,

I would like to give a solution to the problem at the end of the article on the Fibonacci sequence. The problem was to find the limit of the sequence

$$1 + \cfrac{1}{1 + \cfrac{1}{1 + \ddots}} \; - -$$

Let x = this limit. Then

$$x = 1 + \cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{1 + \ddots}}}$$

If we look at fractional part it looks as though the sequence is repeated. And therefore we get

$$x = 1 + \frac{1}{x}$$

$$x^2 = x + 1$$

$$x^2 - x - 1 = 0.$$

$$x = (1 \pm \sqrt{1+4})/2$$

But $x > 0$.

So $$x = (1 + \sqrt{5})/2.$$

Peter Hehir,
St. Ignatius

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Schools Mathematics Competition Solutions

The solutions to the above competition for the years 1962 to 1971 are available in duplicated form at a cost of 10 cents for each year (Junior) and 10 cents for each year (Senior) or 6 copies for 50c. The solutions for 1972 are in Parabola Vol. 8 No. 2 and the solutions for 1973 are in Parabola Vol. 9 No. 2 – each at a cost of 35c.