Mersenne and Cole

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PICTURES FROM MACTUTOR HISTORY OF MATHEMATICS ARCHIVE

Prime Numbers and Mersenne

Mersenne primes are of the form $M_n = 2^n - 1$

$M_n \; is \; prime \Rightarrow n \; is \; prime$

But which prime n generate prime M_n?

Marin Mersenne (1588 – 1648) came up with a list:

$$n = 2, 3, 5, 7, 13, 17, 19, 31, 67, 127, 257$$

Correcting Mersenne!

Up to M_{19} were already known

M_{31} and M_{127} are also correct!

But M_{67}& M_{257} are composite

And Mersenne missed M_{61}, M_{89} & M_{107}

Éduoard Lucas (1876) proved M_{67} composite without finding a factor

Enter Frank Nelson Cole

We know that M_{67} is not prime, but what are the factors?

In 1903 Frank Nelson Cole delivered a lecture composed of two calculations:

$$2^{67} - 1$$
$$= 147{,}573{,}952{,}589{,}676{,}412{,}927$$

$$193{,}707{,}721 \times 761{,}838{,}257{,}287$$
$$= 147{,}573{,}952{,}589{,}676{,}412{,}927$$

3 years of Sundays well spent!