

Mersenne Numbers

Mersenne Primes: Numbers of the form

$$M_n = 2^n - 1$$

are called **Mersenne numbers** after **Father Marin Mersenne** (1588 – 1648). If M_n is **prime**, then M_n is called a **Mersenne prime** (in which case $n = p$ has to be a prime as well). The first six are:

$$M_2 = 3, M_3 = 7, M_5 = 31, M_{13} = 8191,$$

$$M_{17} = 131071, M_{19} = 524287, \dots$$

Although the list continues, it is **unknown** at present whether there are **infinitely many** Mersenne primes. (Currently **48** Mersenne primes are known.)

Primality Testing: By **Fermat's method** (and other related methods), one can test Mersenne numbers for primality **much faster** than usual numbers. Thus, it is no accident that the **largest known** prime (at present) is a Mersenne prime:

$$M_{57885161} = 2^{57,885,161} - 1,$$

which has **17.4 million** digits. This prime number was announced in **February 2013**.