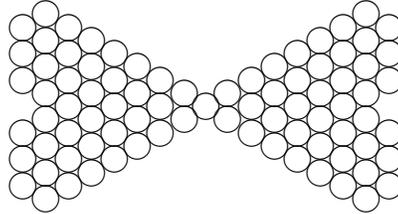# 83 Eighty-Three LXXXIII

Corresponding ordinal: eighty-third.

The number 83 is the forty-second odd number and the twenty-third prime number.

The number 83 has two divisors: 1 and 83.

The number 83 is the sixty-fourth deficient number.

As a sum of four or fewer squares: $83 = 1^2 + 1^2 + 9^2 = 3^2 + 5^2 + 7^2 = 1^2 + 3^2 + 3^2 + 8^2 = 3^2 + 3^2 + 4^2 + 7^2$. Note that 83 is the sum of the squares of the single digit odd primes.

As a sum of nine or fewer cubes: $83 = 3 \cdot 1^3 + 2 \cdot 2^3 + 4^4 = 2 \cdot 1^3 + 3 \cdot 3^3 = 7 \cdot 2^3 + 3^3$.

As a difference of two squares: $83 = 42^2 - 41^2$.

The number 83 appears in only one Pythagorean triple $[83, 3444, 3445]$, which is primitive, of course.

As a sum of three odd primes: $83 = 3 + 7 + 73 = 3 + 13 + 67 = 3 + 19 + 61 = 3 + 37 + 43 = 5 + 5 + 73 = 5 + 7 + 71 = 5 + 11 + 67 = 5 + 17 + 61 = 5 + 19 + 59 = 5 + 31 + 47 = 5 + 37 + 41 = 7 + 17 + 59 = 7 + 23 + 53 = 7 + 29 + 47 = 11 + 11 + 61 = 11 + 13 + 59 = 11 + 19 + 53 = 11 + 29 + 43 = 11 + 31 + 41 = 13 + 17 + 53 = 13 + 23 + 47 = 13 + 29 + 41 = 17 + 19 + 47 = 17 + 23 + 43 = 17 + 29 + 37 = 19 + 23 + 41 = 23 + 23 + 37 = 23 + 29 + 31$.

There are 83 nine-digit numbers, consisting of distinct digits, that are squares. These range from $102495376 = 10124^2$ to $923187456 = 30\,384^2$.

There are exactly 83 *right truncatable primes*, that is, they remain prime if you chop off any right-hand piece. The largest is 73939133. It, along with 7, 73, 739, 7393, 73939, 739391, 7393913, are primes (and, of course, right truncatable). There are 24 such primes with first digit 2 and with first digit 7, there are 23 with first digit 3, and 12 with first digit 5.

The number $83^3 = 571\,787$ is the largest cube which is the concatenation of two three-digit primes. The only other one is $47^3 = 103\,823$.

The number 83 is the first prime that can be written as a sum of composites in more ways than as a sum of primes: it can be written as a sum of primes in 12488 ways and as a sum of composites in 12964 ways.

The average of all primes up to 83 is its reversal 38. The only primes less than a million for which the average of all primes that far is an integer are 2, 83, 241, 6599, and 126551. The averages for 241, 6599, and 126551 are 110, 3066, and 60020.

The number $2^{83} = 9671\,406\,556\,917\,033\,397\,649\,408$ does not contain the digit 2.

W. H. Auden: "Let me tell you a little story, About Miss Edith Gee; She lived in Clevedon Terrace, At number 83."

At age 83 Charlie Chaplin won an oscar for best music (original score) for the movie *Limelight*.

In Deuteronomy 8:3, "Man lives not by bread alone", the word "bread", and the phrase "man lives", both have the value 83 in Hebrew.