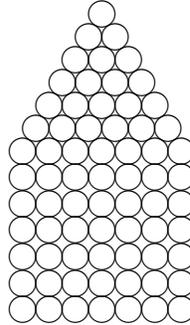# 70 Seventy LXX

Corresponding ordinal: seventieth.

The number 70 is the thirty-sixth even number and the fiftieth composite number.

As a product of primes: $70 = 2 \cdot 5 \cdot 7$.

The number 70 has eight divisors: 1, 2, 5, 7, 10, 14, 35, 70.

The number 70 is the fourteenth abundant number: $s(70) = 1+2+5+7+10+14+35 = 74 > 70$.

As a sum of four or fewer squares: $70 = 3^2 + 5^2 + 6^2 = 1^2 + 1^2 + 2^2 + 8^2 = 1^2 + 2^2 + 4^2 + 7^2 = 2^2 + 4^2 + 5^2 + 5^2 = 3^2 + 3^2 + 4^2 + 6^2$.

As a sum of nine or fewer cubes: $70 = 6 \cdot 1^3 + 4^3 = 3 \cdot 1^3 + 5 \cdot 2^3 + 3^3 = 2 \cdot 2^3 + 2 \cdot 3^3$.

The number 70 appears in five Pythagorean triples: $[42, 56, 70]$, $[24, 70, 74]$, $[70, 168, 182]$, $[70, 240, 250]$, $[70, 1224, 1226]$. None of these are primitive because 70 is twice an odd number. They are multiples of primitive triples that contain the divisors 5, 7, and 35 of 70, namely, $14\,[3, 4, 5]$, $2\,[12, 35, 37]$, $14\,[5, 12, 13]$, $10\,[7, 24, 25]$, $2\,[35, 612, 613]$.

As a sum of two odd primes: $70 = 3 + 67 = 11 + 59 = 17 + 53 = 23 + 47 = 29 + 41$.

The number 70 is a pentagonal number, as you can see.

The number 70 is the smallest *weird* number. That is, 70 is abundant, but no subset of its proper divisors adds to 70. The next weird number is 836.

The sum of the digits of $2^{70} = 1180\,591\,620\,717\,411\,303\,424$ is 70. The only number less than 70 with this property is 5, which is the sum the digits of $2^5 = 32$. A related fact is that the $n \equiv 2^n \mod 9$ exactly when $n \equiv 5 \mod 18$ or $n \equiv 16 \mod 18$. Note that $70 \equiv 16 \mod 18$.

The number $70^2 = 4900$ is a pyramidal number because it is the sum of the first 24 squares, so 70^2 balls can be stacked in a pyramid. It is the only square, other than 1, that is a pyramidal number. This is known as the *Cannonball Problem*: you have cannonballs arranged in a square on the ground and you want to stack them into a pyramid. The last three items are from *Number Gossip*.

There are 70 ways to color a square black and white by coloring some of the eight triangles in the figure below black and the rest white.
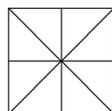
Here are three examples:
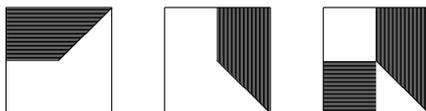
The first two are the same because we can rotate one by $90°$ to get the other. These squares are used for the *Izzi puzzle* in which you arrange 64 of them in an eight-by-eight array to form various patterns. Six of the squares are omitted from the puzzle—the ones in which rotation by $90°$ results in either the same square, or the same square with the colors interchanged.

Psalm 90:10, "The days of our years are threescore years and ten." So we live 70 years.

Genesis 10 lists 70 descendants of Noah's sons: 26 from Shem, 30 from Ham, and 14 from Japheth.