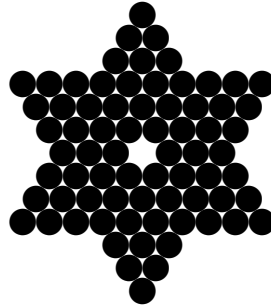


72 Seventy-Two LXXII



Corresponding ordinal: seventy-second.

The number 72 is the thirty-seventh even number and the fifty-first composite number.

As a product of primes: $72 = 2^3 3^2$.

The number 72 has twelve divisors: 1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72.

The number 72 is the fifteenth abundant number: $s(72) = 1 + 2 + 3 + 4 + 6 + 8 + 9 + 12 + 18 + 24 + 36 = 123 > 72$.

As a sum of four or fewer squares: $72 = 6^2 + 6^2 = 2^2 + 2^2 + 8^2 = 2^2 + 4^2 + 4^2 + 6^2$.

As a sum of nine or fewer cubes: $72 = 8 \cdot 1^3 + 4^3 = 2 \cdot 1^3 + 2 \cdot 2^3 + 2 \cdot 3^3 = 2^3 + 4^3 = 9 \cdot 2^3$.

As a difference of two squares: $72 = 9^2 - 3^2 = 11^2 - 7^2 = 19^2 - 17^2$.

The number 72 appears in twelve Pythagorean triples:

[21, 72, 75]	[30, 72, 78]	[54, 72, 90]	[65, 72, 97]
[72, 96, 120]	[72, 135, 153]	[72, 154, 170]	[72, 210, 222]
[72, 320, 328]	[72, 429, 435]	[72, 646, 650]	[72, 1295, 1297]

The fourth and the last are primitive.

As a sum of two odd primes: $72 = 5 + 67 = 11 + 61 = 13 + 59 = 19 + 53 = 29 + 43 = 31 + 41$.

The number $72^5 = 19^5 + 43^5 + 46^5 + 47^5 + 67^5$ is the smallest fifth power that is equal to the sum of five other fifth powers. (Penguin dictionary)

The number 72 is the smallest number than be written as the sum of nine or fewer cubes in four ways. The only other such number less than 101 is 91.

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The number 72 is *highly totient*, that is, there are more solutions k to the equation $\varphi(k) = 72$ than for any number less than 72. There are seventeen of them: 73, 91, 95, 111, 117, 135, 146, 148, 152, 182, 190, 216, 222, 228, 234, 252, 270. The next highly totient number is 144 for which there are 21 solutions.

Each exterior angle of a regular pentagon is 72° .

The number 72 is a half gross, or is it just half gross?