How many positive divisors has a number N

Marcos Daniel Calderón-Calderón

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1 Finding the number of positive divisors of n

1.1 How many positive divisors does the number 2600 have?

It is slow to manually find all positive integers divisors of a given number. The correct way to solve this problem is as follows:

- The fundamental step is **to find the prime factorization of the number**:

$$2600 = (26)(100) = (13)(2)(10)(10) = (13)(2)(5)(2)(5)(2)$$

$$= (13)^1 (2)^3 (5)^2$$

- Any divisor of 2600 must be a product of some number of $13's$ (between 0 and 1), some number of $2's$ (between 0 and 3) and some number of $5's$ (between 0 and 2). In general, if the prime factorization of the number n is known, then to calculate how many positive divisors it has, 1 is added to each exponent in the factorization and finally multiply these "exponents + 1"s together. For the number 2600, the solution is:

$$= (2)(4)(3) = 24$$