Finding The Number Of Positive Integral Divisors:

A. This method uses *primes* and prime factorization.

    1. To find the prime factorization of a number we must break down a number to its most basic form using only prime numbers.

        Ex [1] The prime factorization of 48 = 2 x 2 x 2 x 2 x 3.

            a. Notice that the only numbers that are here are prime numbers.

            b. If we write it in exponential form we get: 2^3 x 3.

            c. To find the number of positive integral divisors we will need to first f ind the prime factorization in exponential form.

B. Using the above information we can find the number of positive integral divisors a number has.

    1. The positive integral divisors of a number is every integer that can divide into that number evenly.

        Ex [1] The number 48 has 10 positive integral divisors.   They are:

1	48
2	24
3	16
4	12
6	8

            a. Notice that the numbers 1 and 48 also count. That means that every number has at least 2 positive integral divisors.

            b. Also, note that you could count them on your finger or in your head but there is a quick method to finding the number.

    2. To find the number of positive integral divisors, first find the numbers exponential prime factorization.

    3. Add one to each exponent and multiply them together. This is the answer.

Ex [1] The number 48 has how many positive integral divisors?

   a. First find the prime factorization: 2^4 x 3^1.

   b. Adding 1 to each exponent we get: 4+1 and 1+1 or 5 and 2.

   c. Multiplying these numbers together we get 10.

   d. The answer is 10.

Ex [2] The number 60 has how many positive integral divisors?

   a. Find the prime factorization: 2^2 x 3^1 x 5^1.

   b. Add 1 to each exponent we get: 2+1, 1+1, and 1+1 or 3, 2, and 2.

   c. Multiplying these together we get: 3 x 2 x 2 or 12.

   d. The answer is 12.