Problem of the Week
Grade 11 and 12

Powerfully Perfect Squares

The prime factorization of 20 is $2^2 \times 5$.

The divisors of 20 are:

$$2^0 5^0 = 1,\ 2^0 5^1 = 5,\ 2^1 5^0 = 2,\ 2^1 5^1 = 10,\ 2^2 5^0 = 4,\ \text{and } 2^2 5^1 = 20.$$

The number 20 has 6 divisors. Two of the divisors, 1 and 4, are perfect squares.

How many divisors of 2012^{2012} are perfect squares?