

① What is the smallest positive integer that has 10 divisors?

$t(n) = 10$, $10 = 2 \cdot 5 \leftarrow 10$ can be represented as a product of at most 2 numbers different from 1.

The number has one prime in PND to exponent of 9 or two primes to exponents!

$$e_1 = 2 - 1 = 1, \quad e_2 = 5 - 1 = 4$$

Pick smallest primes (choose larger exp on smaller prime)

$$N = 2^4 \cdot 3^1 = \textcircled{48} \quad \text{or} \quad N = 2^9 = 512$$

\uparrow smallest positive integer.

② If A and B are perfect squares,

Can their product have 10 divisors?

$A = a^2, B = b^2 \leftarrow$ Both A, B are perfect squares.

$AB = a^2 b^2 = (ab)^2$ which is also a perfect square.

that will itself have an odd number of divisors that is certainly not 10.