15. For how many positive integers n is $4^n - 1$ a prime number?

A 0 B 1 C 2 D 3 E infinitely many

---

15. B A prime number has exactly two factors, one of which is 1. The expression $4^n - 1$ can be factorised as $4^n - 1 = (2^n + 1)(2^n - 1)$. For $4^n - 1$ to be prime, the smaller of the factors, $2^n - 1$, must equal 1.
If $2^n - 1 = 1$ then $2^n = 2$ giving $n = 1$. So there is exactly one value of n for which $4^n - 1$ is prime and this value is 1.