# Question

Question ID: 889

19. How many prime numbers $p$ are there such that $199p + 1$ is a perfect square?

A 0 B 1 C 2 D 4 E 8





# Answer

**19. B** Let $199p + 1 = X^2$. Then $199p = X^2 - 1 = (X + 1)(X - 1)$. Note that 197 is prime. If $p$ is also to be prime then **either** $X + 1 = 199$, in which case $X - 1 = 197$, **or** $X - 1 = 199$, in which case $X + 1 = 201$ (and $201 = 3 \times 67$ is not prime). Note that $X - 1 = 1, X + 1 = 199p$ is impossible. Hence $p = 197$ is the only possibility.