12. The factorial of n, written $n!$, is defined by $n! = 1 \times 2 \times 3 \times \ldots \times (n-2) \times (n-1) \times n$.
Which of the following values of n provides a counterexample to the statement:
"If n is a prime number, then $n! + 1$ is also a prime number"?

A 1 B 2 C 3 D 4 E 5

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12. **E** It is necessary to test only $n = 2$, $n = 3$, $n = 5$ since the other two possible values are not prime. $2! + 1 = 3$, which is prime; $3! + 1 = 7$, which is prime; but $5! + 1 = 121$, which is not prime. So $n = 5$ provides the counterexample.