A. Cervantes.

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- There exist an integer k such that $k \geq 4$ and $2k^2 - 5k + 2$ is prime.
- $\exists$ an integer $k \mid k \geq 4$ and $2k^2-5k+2$ is prime.
- Showing that this statement is false is equivalent to showing that its negation is true.

negation $\rightarrow$ $\forall$ integers k such that $k \geq 4$ and $2k^2-5k+2$ is not prime.

$$\left.\begin{aligned} 2k^2-5k+2 &= 2k^2-4k-k+2 \\ &= 2k(k-2)-1(k-2) \\ &= (2k-1)(k-2) \end{aligned}\right\} \text{Basic Algebra.}$$

$$\left.\begin{aligned} 1 < 2k-1 < 2k^2-5k+2 \\ \text{and} \\ 1 < k-2 < 2k^2-5k+2 \end{aligned}\right\}$$ $(2k-1)$ and $(k-2)$ are positive integers greater than 1 and smaller than $2k^2-5k+2$ since $k \geq 4$.

n is prime $\leftrightarrow$ $\forall$ positive integers r and s, if $n = r \cdot s$ then $r = 1$ or $s = 1$. } Definition of prime numbers.

$2k^2-5k+2$
$(2k-1)(k-2)$ } Product of two positive integers greater than 1.

$2k^2-5k+2$ is not a prime.

$\therefore$ $\exists$ an integer k such that $k \geq 4$ and $2k^2-5k+2$ is not prime. Q.E.D.