

36 There exist an integer n
such that $6n^2 + 27$ is prime

$$3(2n^2 + 9) \quad \leftarrow \text{basic algebra}$$

$$\text{Let } k = 2n^2 + 9$$

$$3k = 6n^2 + 27 \quad \leftarrow \text{substitution}$$

\therefore Any integer k
will result in a
number which is
a multiple of 3.
Not fitting the
definition of a prime
number

QED

Answer: False

Since 6 and 27 are
divisible by 3,

any integer plugged in for
 n will also be divisible
by three, \therefore not a prime