

4.1 # 51

For all integers n , if n is prime then $(-1)^n = -1$

\forall integers $n \in$ prime numbers; $(-1)^n = -1$

This is not a true statement

because if you substitute $n=2$, then $(-1)^2 = -1$

$$1 \neq -1$$

Let n be an arbitrary prime number

$n = rs$ $n, \text{ or } s$ must equal 1 def. of a prime number
 $(-1)^n = -1$ substitute the integer.

$$(-1)^n = -1$$

$\therefore n$ is a prime number

Q.E.D.