Let x be a prime number, then $(x-2, x, x+2)$ is a prime triple.

A property of twin primes says that all of them except $(3, 5)$ are of the form $6n \pm 1$, where $n \in Q$.

That means that the least distance between two primes must be $6 \pm 1 = 4$. In a triple we have two twin primes $(x-2, x)$ and $(x, x+2)$. But the distance between them is less then 4. The only possible solution include exceptional pair $(3, 5)$ and a pair $(6n-1, 6n+1)$ with $n = 1 \rightarrow (5, 7)$. That is the prime triple $(3, 5, 7)$.
QED.