1. We want to show that if we pick an $m \in N$, then exists an $n \in N$, such that $3m + 5n = 12$ is true.

Consider $3m+5n = 12$. By rearranging the equation, we have

$$5n = 12 - 3m$$

$$5n = 3(4-m)$$

So for the above equation to hold, we need two things:

① n to be a multiple of 3. (because 3 and 5 are primes)

② $4-m$ to be a multiple of 5. (because 3 and 5 are primes)

However, if $4-m$ is a multiple of 5, $\exists\, k \in N$ such that

$$4 - m = 5k$$

$$m = 4 - 5k < 0$$

This contradicts the fact that $m \in N$. So we conclude that it is false that $(\exists m \in N)(\exists n \in N)(3m + 5n = 12)$.