

False. Proof:

Assume that $(\exists m \in \mathbb{N})(\exists n \in \mathbb{N})(3m+5n=12)$ is true, then $n = \frac{12-3m}{5}$.

Since $m \in \mathbb{N}$, when $m=1, 2, 3, 4, 5 \dots$,

$$n = \frac{9}{5}, \frac{6}{5}, \frac{3}{5}, 0, -\frac{3}{5} \dots$$

Clearly, n strictly decreases as m increases. For $n > 0$, there is no $n \in \mathbb{N}$, which contradicts with the assumption.

So the assumption $(\exists m \in \mathbb{N})(\exists n \in \mathbb{N})(3m+5n=12)$ is false.