The proof is by induction. First, let $n = 2$. Then $(1+h)^2 = 1 + 2h + h^2$. Since $h > 0$, so is h^2, hence $1 + 2h > (1+h)^2$.

Now suppose the inequality holds for any $n > 1$ and less than $N \in N$. Then by the induction step we have

$$\begin{aligned}(1+h)^N &= (1+h)^{N-1}(1+h) \\ &= (1+h)^{N-1} + h(1+h)^{N-1} \\ &> 1 + (N-1)h + h + (N-1)h^2 \\ &> 1 + (N-1)h + h = 1 + Nh.\end{aligned} \tag{1}$$

Hence, by induction, the inequality holds for all N as desired.