From calculus, the formal definition of the limit of a function $f : \mathbb{R} \rightarrow \mathbb{R}$ is that \( \lim_{x \rightarrow a} f(x) = L \) if the following statement holds true:

For every real number \( \varepsilon > 0 \) there exists a real number \( \delta > 0 \) with the property that if \( |x - a| < \delta \) then \( |f(x) - L| < \varepsilon \).

Using this definition, prove that \( \lim_{x \rightarrow 3} 2x = 6 \).