If $\{a_n\}_{n=1}^{\infty}$ tends to limit L as $n \to \infty$,
as definition we get $\forall \epsilon > 0, \exists N > 0$ where $\forall n > N, |a_n - L| < \frac{\epsilon}{M}$.
So, $\forall n > N, |Ma_n - ML| = M|a_n - L| < M * \frac{\epsilon}{M} = \epsilon$.
It means the sequence $\{Ma_n\}_{n=1}^{\infty}$ tends to the limit ML.
Hence, it's proved true.