8. If the sequence $\{a_n\}_{n=0}^{\infty}$ tends to limit L as $n \to \infty$, then for any fixed number $M > 0$, the sequence $\{Ma_n\}_{n=0}^{\infty}$ tends to limit ML.

   Proof:

   $\{a_n\}_{n=0}^{\infty}$ tends to limit L as $n \to \infty$. This means that given $\epsilon > 0$, $\exists n' \in \mathbb{N}$, such that $|a_n - L| < \frac{\epsilon}{M}, \forall n \geq n'$.

   So $\forall n \geq n', |Ma_n - ML| = M|a_n - L| \leq M\frac{\epsilon}{M} = \epsilon$.

   Therefore, the sequence $\{Ma_n\}_{n=0}^{\infty}$ tends to limit ML.