Problem 8

proof:

For any $\epsilon > 0$ be given, we set $\epsilon' = \dfrac{\epsilon}{M}$

From the question, we know the sequence $\{a_n\}_{n=1}^{\infty}$ tends to limit L as $n \to \infty$, so that for ϵ', we can find N_0, and then we know

$$|a_n - L| < \epsilon' \ for \ n > N_0$$

And,

$$\epsilon' = \frac{\epsilon}{M}, \ M > 0$$

Then,

$$|Ma_n - ML| < \epsilon' \ for \ n > N_0$$

So, the sequence $\{Ma_n\}_{n=1}^{\infty}$ tends to the limit ML. And the **Theorem** is right.

The proof is complete.