Question 8

Let ε > 0 be assumed.

If $\{a_n\}$ converges to L, then there exists a positive integer N such that $|a_n - L| < \frac{\varepsilon}{M} \; \forall \; n > N.$

So

$$|Ma_n - ML| = \; |M||a_n - L| < M\left(\frac{\varepsilon}{M}\right) = \; \varepsilon \; \forall \; n > N$$

Therefore $\{Ma_n\}$ converges to ML