Homework #3

$\boxed{1}$ By carefully negating the definition of convergence, state what it means for the sequence (a_n) from the metric space (X, d) to diverge. Your statement should begin "The sequence (a_n) from (X, d) diverges if and only if for every $L \in X$...".

$\boxed{2}$ Suppose (a_n) is a sequence from $(\mathbb{R}, d_1)$. Show that if (a_n) converges to L then its sequence of *Cesaro means* (s_n) defined by

$$s_n = \frac{1}{n+1} \sum_{i=0}^{n} a_i$$

also converges to L. Also give an example of a divergent sequence (a_n) whose Cesaro means converge.