Homework #2

1 By negating the definition of convergence of a sequence, state what it means for the sequence (a_n) from the metric space (X, d) to *not converge*.

2 *Using only the definition of convergence*, show that the sequence (a_n) given by $a_n = (-1)^n$ does not converge in $(\mathbb{R}, d_1)$.

3 Suppose (a_n) is a sequence from $\mathbb{R}$. Show that if (a_n) converges to L then the sequence (of Cesaro means) (s_n) defined by

$$s_n = \frac{1}{n+1} \sum_{j=0}^{n} a_j$$

also converges to L. Does the converse also hold?