Name: _____   Score (Out of 6 points):

1. (6 points) Let (X, d) be a metric space, and let $x, y \in X$ be two distinct points. Consider the alternating sequence

$$a_1 = x$$
$$a_2 = y$$
$$a_3 = x$$
$$a_4 = y$$
$$a_5 = x$$
$$a_6 = y$$
$$\vdots$$

Prove that the sequence $(a_n)_{n \in \mathbb{N}}$ does **not** converge.