1. Let X be a non-empty set and for all $x_1, x_2 \in X$ let $d(x_1, x_2) = 0$ if $x_1 = x_2$ and $d(x_1, x_2) = 1$ otherwise. Show (X, d) is a metric space.

2. Show that if $(V, ||\cdot||)$ is a normed vector space then it is a metric space under $d(v_1, v_2) = ||v_1 - v_2||$.

3. Show that $||\cdot||_1$ is a norm on $\mathbb{R}^n$ for all n .