Fast Quiz #1
Numerical Functional Analysis

Præparatus supervivet

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Uppsala, February 2022
True/False: $d(x, y) = |x - y|^2$ is a metric on $\mathbb{R}$. 
Question 2

**True/False:** Suppose $X$ is some space. Then for $x, y \in X$, $d(x, y) = 0$ when $x = y$ and $= 1$ otherwise defines a metric.
True/False: The *distance metric* between any two subsets $A$ and $B$ of a metric space $(X, d)$ is given by

$$D(A, B) = \inf_{a \in A, b \in B} d(a, b).$$
Question 4

**True/False:** Sets can be both open and closed at the same time.
Question 5

**True/False:** \( d(x, y) = |x - y|^{1/2} \) is a metric on \( \mathbb{R} \).
Question 6

**True/False:** A sequence \((x_n) \in X\) in a metric space which converges has to be bounded.
True/False: The subset of polynomials in the metric space $C[a, b]$ is closed.
True/False: The set $[-1, 1]\setminus\{0\}$ is an incomplete subspace of $\mathbb{R}$. 