

Fast Quiz #1

Numerical Functional Analysis, 5.0 hp

Præparatus supervivet

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1. **True/False:** $d(x, y) = |x - y|^2$ is a metric on \mathbf{R} .
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.
3. **True/False:** The *distance metric* between any two subsets A and B of a metric space (X, d) is given by

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

4. **True/False:** Sets can be both open and closed at the same time.
5. **True/False:** $d(x, y) = |x - y|^{1/2}$ is a metric on \mathbf{R} .
6. **True/False:** A sequence $(x_n) \in X$ in a metric space which converges has to be bounded.
7. **True/False:** The subset of polynomials in the metric space $C[a, b]$ is closed.
8. **True/False:** The set $[-1, 1] \setminus \{0\}$ is an incomplete subspace of \mathbf{R} .