



Math for the people, by the people.

metric equivalence

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Let X be a set equipped with two metrics ρ and σ . We say that ρ is *equivalent* to σ (on X) if the identity map on X , is a homeomorphism between the metric topology on X induced by ρ and the metric topology on X induced by σ .

For example, if (X, ρ) is a metric space, then the function $\sigma : X \rightarrow \mathbb{R}$ defined by

$$\sigma(x, y) := \frac{\rho(x, y)}{1 + \rho(x, y)}$$

is a metric on X that is equivalent to ρ . This shows that every metric is equivalent to a bounded metric.