



Metric Balls

1 Why

We speak of a set of elements of a metric space which are all within some distance of a fixed point.

2 Definition

The inspiration is balls in space.

Consider a metric space and an element of the base set. The *metric ball* of radius r centered at the element is the set of all elements which are less than r -distance from the element.

2.1 Notation

Let (A, d) be a metric space. Let $a \in A$. Let r be a real number. Then the ball centered at a of radius r is

$$\{b \in A \mid d(a, b) < r\}.$$

We denote the ball centered at a of radius r by $B(a, r)$.