Absolute value

Absolute value measures distance.

So $|1| = |1 - 0| = 1$ says, the distance between ”1” and ”0” is 1.

If we write $|2 - 1| = 1$ we can say, the distance between ”2” and ”1” is 1.

If we write $|2 - a|$ we can say, the distance between ”2” and ”a”.

If we write $|2 - a| < \varepsilon$ we can say, the distance between ”2” and ”a” is less than epsilon (ε).

Formal Definition

Let $f : A \to \mathbb{R}$, where $A \subseteq \mathbb{R}$ and $a \in A$ an interior point. We say

$$\lim_{x \to a} f(x) = L$$

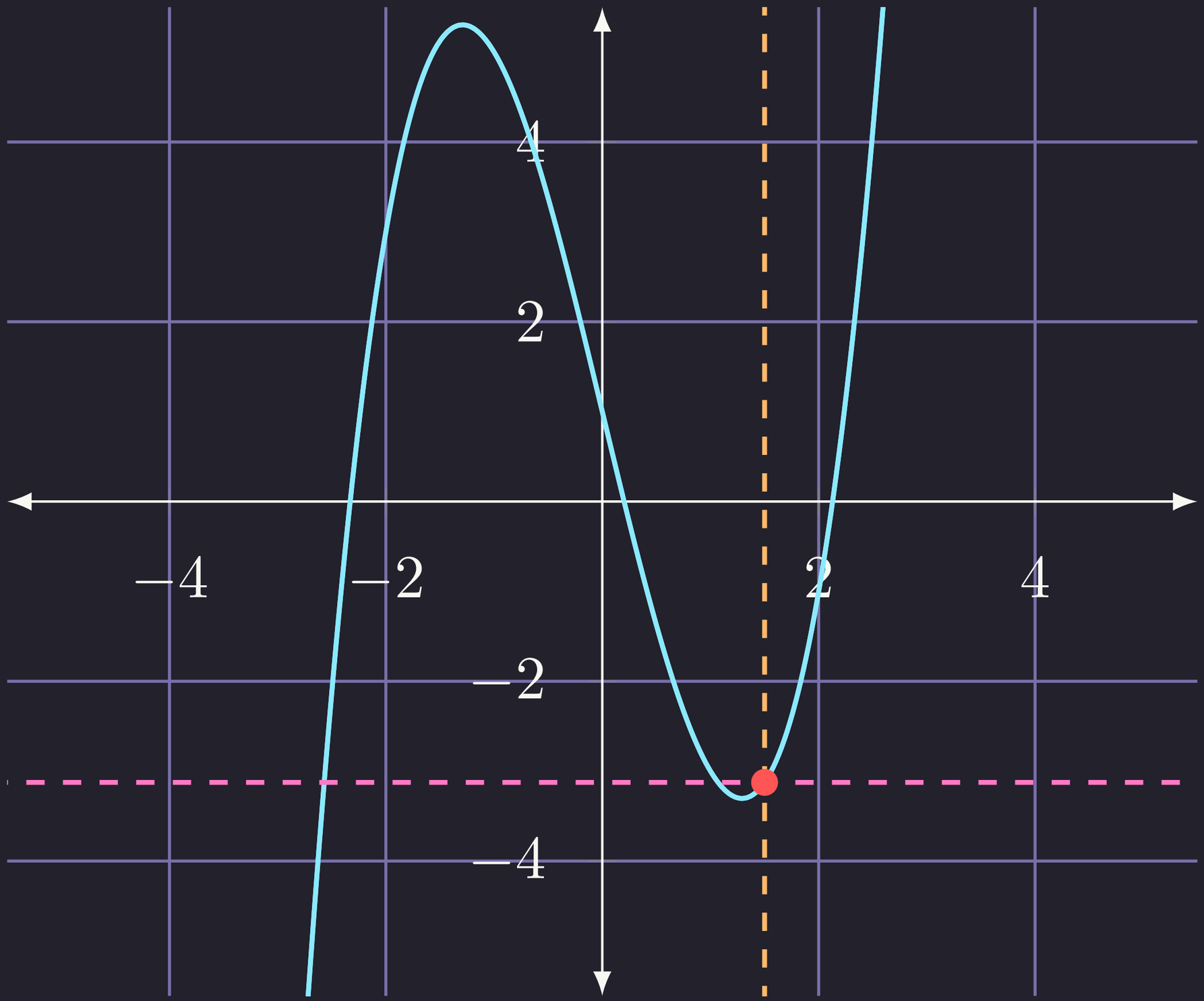
if $\forall\ \varepsilon > 0$, $\exists\ \delta > 0$ such that, if

$$|x - a| < \delta$$

then

$$|f(x) - f(a)| < \varepsilon.$$

We pick a number and call it ε, any number we want. Based on epsilon we pick a number δ so that for any number x in the interval $a - \delta < x < a + \delta$, $|f(x) - f(a)| < \varepsilon$.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