

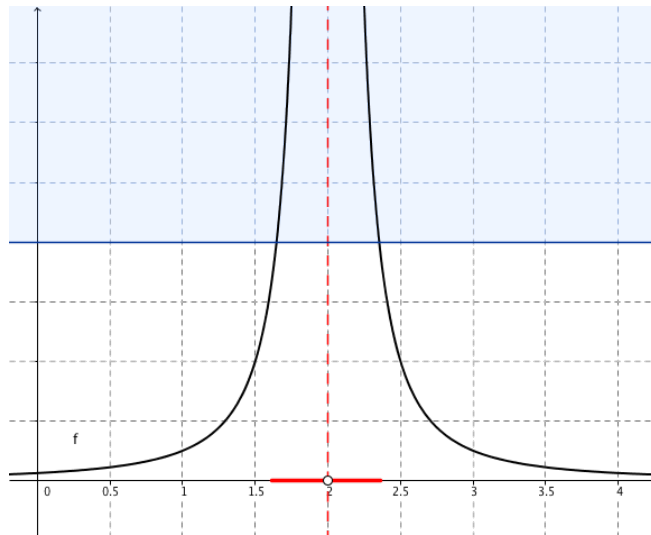
## The Precise Definition of an Infinite Limit

### Definition of + Infinite Limit

$$\lim_{x \rightarrow a} f(x) = +\infty$$

if for every number  $M > 0$  there is a number  $\delta > 0$  such that

$$\text{if } 0 < |x - a| < \delta \quad \text{then} \quad f(x) > M$$



### Definition of - Infinite Limit

$$\lim_{x \rightarrow a} f(x) = -\infty$$

if for every number  $N < 0$  there is a number  $\delta > 0$  such that

$$\text{if } 0 < |x - a| < \delta \quad \text{then} \quad f(x) < N$$

**Example 1.**

Prove that  $\lim_{x \rightarrow 0} \frac{1}{x^2} = +\infty$ .