Problem 12: Find $\lim_{x\to 0^+} \frac{1}{x}$

Proof. Let N be a real number. We want to find a $\delta > 0$ such that

$$0 < x < \delta \quad \Longrightarrow \quad f(x) > N$$

Let $\delta = \left|\frac{1}{N}\right|$. Then

$$0 < x < \delta \quad \Longrightarrow \quad \frac{1}{x} > N$$

Thus

$$\lim_{x\to 0^+} \frac{1}{x} = \infty$$

□