

Other (Ugly) Discontinuities

The limit $\lim_{x \rightarrow 0} \sin(1/x)$ is undefined as x goes to 0. The graph of $y = \sin(1/x)$ is similar to the one in Figure 1; the function $\sin(1/x)$ has no left or right limit as x goes to 0. Here, we say the limit does not exist.

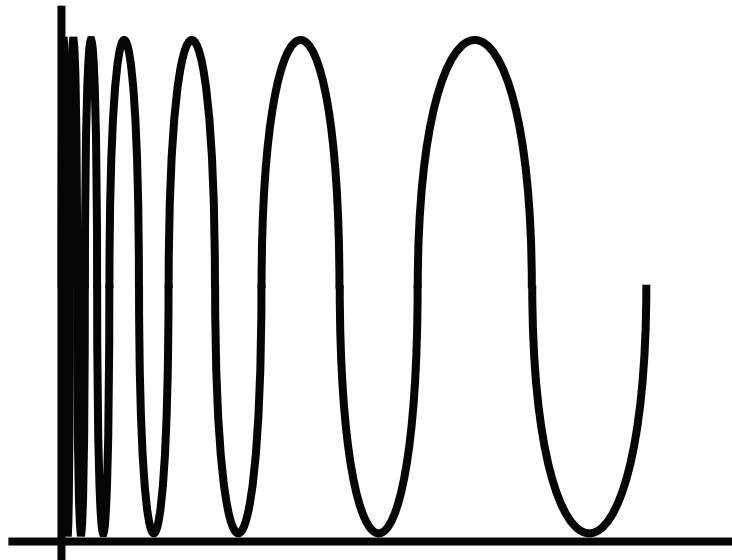


Figure 1: An example of an ugly discontinuity: a function that oscillates a lot as it approaches the origin

There are many discontinuities of this type — for example, things that oscillate as time goes to infinity — but we're not going to worry about them in this course.