


# The Illustrated Limit

Read “The limit of  $f(x)$  as  $x$  approaches  $a$  is  $\infty$ .”  
that is,  $f(x)$  heads to  $\infty$  as  $x$  goes to  $\infty$


$$\lim_{x \rightarrow a} f(x) = \infty \text{ if and only if}$$

for all  $N > 0$

there exists a  $M > 0$

such that

$$x > M \text{ implies } f(x) > N.$$

no matter how big a number you pick

you can find another number

the size of  $x$

is greater than

any large number

that is,  $x$  is really big

the size of  $f(x)$

is greater than

any large number you pick

that is  $f(x)$  is really big