

Source: [KBhMATH401SubIndex](#)

## 1 | Limits

### 1.1 | Warming up

Here's a function

$$y = \frac{1}{x}.$$

We know that it has

- Domain  $D(-\infty, 0)(0, \infty)$
- Range  $R(-\infty, 0)(0, \infty)$
- As  $x \rightarrow \infty$ ,  $y \rightarrow 0$
- Function is *odd*, that is,  $f(-x) = -f(x)$

### 1.2 | The Limit Notation

See [KBhMATH401TheLimitNotation](#)

### 1.3 | Computing Limits Algebraically

See [KBMATH401ComputingLimits](#)

### 1.4 | Types of Discontinuity

See [KBhMATH401Discontinuity](#)

### 1.5 | Error and Epsilon Delta Proofs

See [KbhMATH401EpsilonDeltaProofs](#)

### 1.6 | CN10062020 Continuity

#disorganized #flo

$$\lim_{x \rightarrow a} f(x) \neq f(a).$$

Sometimes

*Notice the definition implicitly requires three things if  $f$  is continuous at  $a$*

1.  $\lim_{x \rightarrow a} f(x)$

*continuous at a*

$$1. \lim_{x \rightarrow a} f(x) \text{ Exists}$$

$$2. f(a) \text{ Exists}$$

$$3. \lim_{x \rightarrow a} f(x) = f(a)$$

Figure 1: threestepslimit.png