

Source: [KBhMATH401Limits](#)

1 | Types of Discontinuity

1.1 | Infinite Discontinuity (vertical asymptote)

Double Sided Limit: does not exist **Function:** not defined

$$f(x) = \frac{x^2+2}{x^2-4} \text{ where } x = 2$$

1.2 | Jump Discontinuity (gap)

Double Sided Limit: does not exist **Function:** defined

“a ceiling function” $f(x) = \lceil x \rceil$ where $x = 3$

1.3 | Point Discontinuity (hole)

Double Sided Limit: exists **Function:** not defined

$$f(x) = \frac{x^6-1}{x^{10}-1} \text{ where } x = 1$$

Division by 0/infinite discontinuity \Rightarrow undefined

Hole \Rightarrow not defined