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 $R(-\infty, 0)(0, \infty)$
- $As\ x \to \infty,\ y \to 0$
- 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$_{x \to a} f(x) \neq f(a)$.
Sometimes
*A function is continuous at $x = a$ if ALL OF the following three conditions:$

1. lim$_{x \to a} f(x)$ exists
2. $f(a)$ exists
3. lim$_{x \to a} f(x) = f(a)$

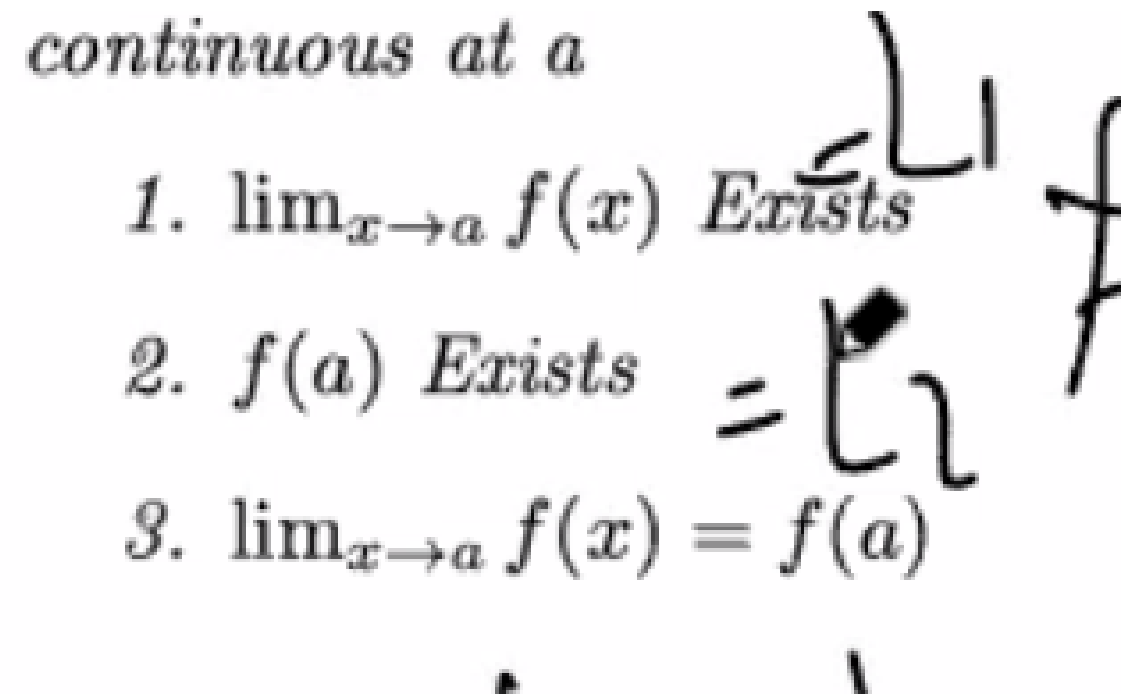

Figure 1: threestepslimit.png

Removable discontinuityRemoveable discontinuity are often holes. They are discontinuities that, with an additional definition, one could remove. For instance, $f(x) = \frac{x^2-x-2}{x-2}$ has a hole at $x = 2$, but if we defined a value for $x = 2$, our lovely discontinuity is immediately removed.

Infitinite discontinuityFunctions that approch infinity If you think about it, if you try to fix the discontinuity, you will be tracing all the way up the infinity

Jump discontinuity"Staircase" functions that causes jump Like…

As you could see, if you try to fix the discontinuity, this would result in vertical lines, which is illegal in functions.

Continuous-from-right: $f(a) = \lim x \to a^+ f(x)$ **Continuous-from-left**: $f(a) = \lim x \to a^- f(x)$

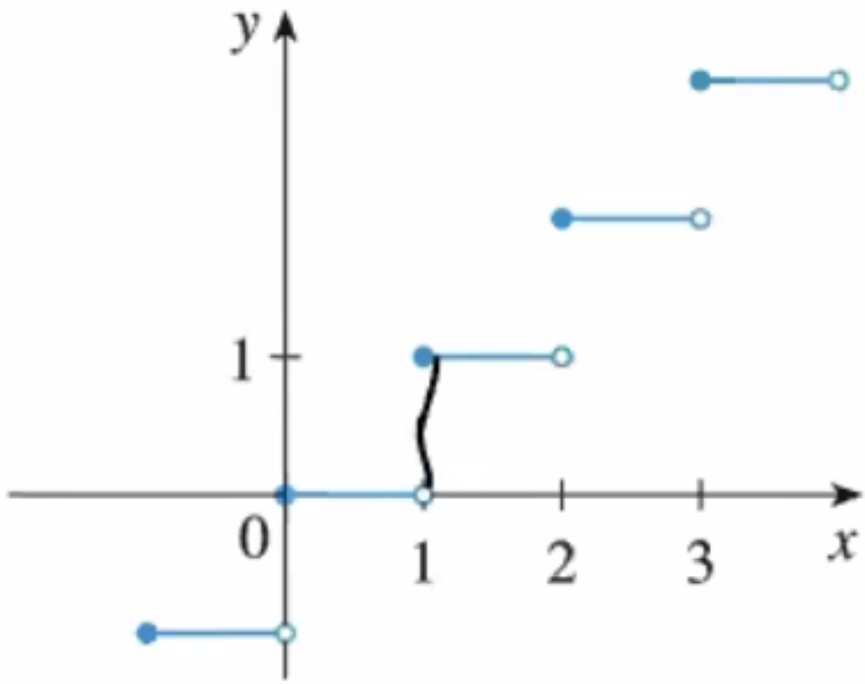

Figure 2: jumpdisc.png