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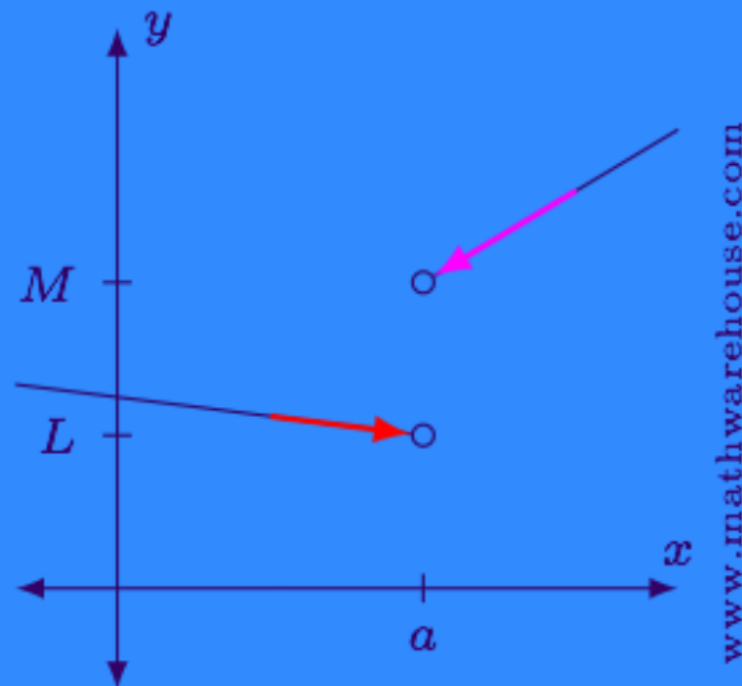
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There are 4 types
of Discontinuities

Jump Discontinuities

The graph below shows a function that is discontinuous at $x = a$.



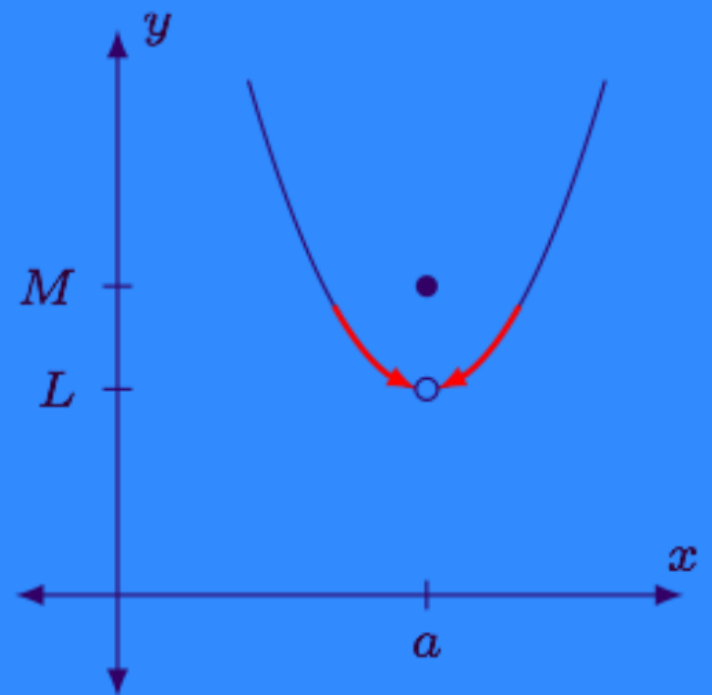
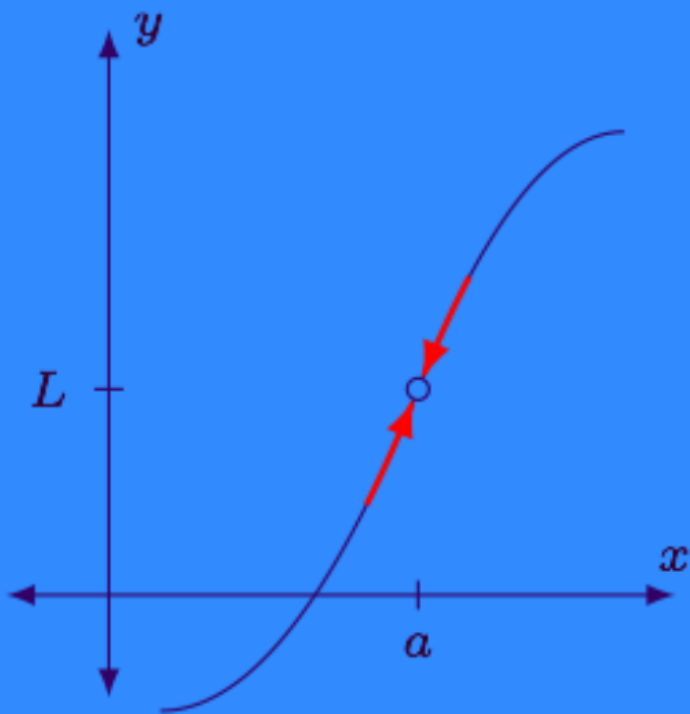
Example of a Jump Discontinuity

The function is approaching different values depending on the direction "x" is coming from. When this happens, we say the function has a jump discontinuity at $x=a$.



Removable Discontinuities

In the graphs below, there is a hole in the function at $x=a$. These holes are called removable discontinuities

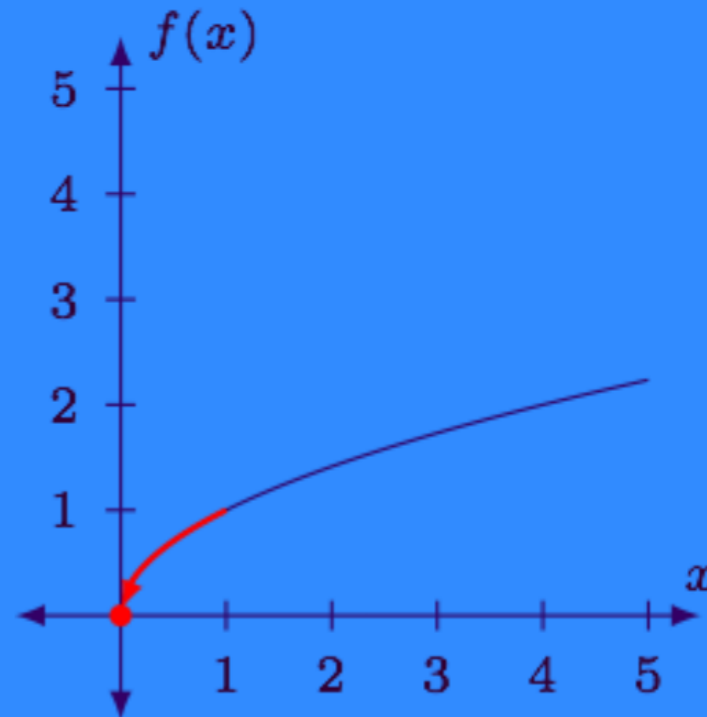


Examples of Removable Discontinuities

Notice that for both graphs, even though there are holes at $x=a$, the limit value at $x=a$ exists.

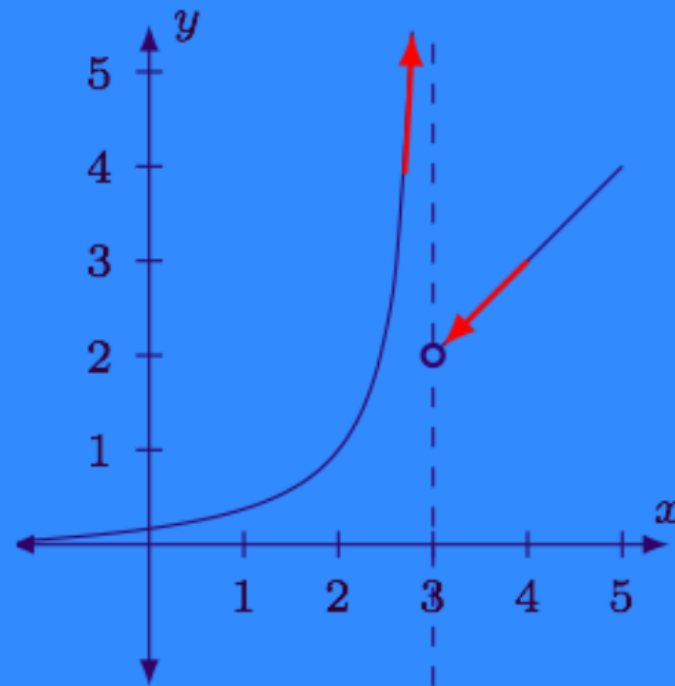
Endpoint Discontinuities

When a function is defined on an interval with a closed endpoint, the limit cannot exist.



The function is technically not continuous there because the limit doesn't exist (because x can't approach from both sides).

Mixed Discontinuities



A Mixed Discontinuity

The function is discontinuous at $x=3$. From the left, the function has an infinite discontinuity.
From the right, the discontinuity is removable.

References:

What are the types of Discontinuities? (n.d.). Retrieved August 28, 2017, from <http://www.mathwarehouse.com/calculus/continuity/what-are-types-of-discontinuities.php>

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Calculus I

First Partial Project