Calculus I

First Partial Project

" Continuity and discontinuity "

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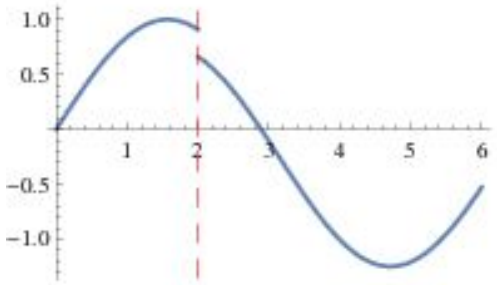
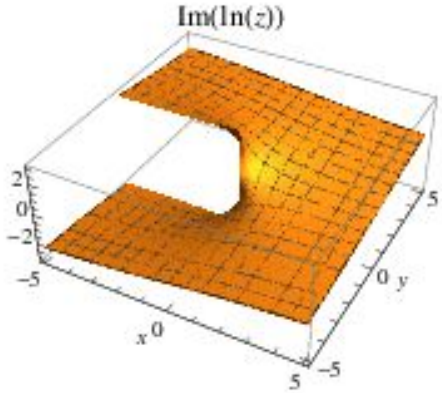
What is discontinuity?

Functions that aren’t continuous at an x value either have a removable discontinuity or a nonremovable discontinuity. Is when the two-sided limit exists but isn't equal to the function's value.



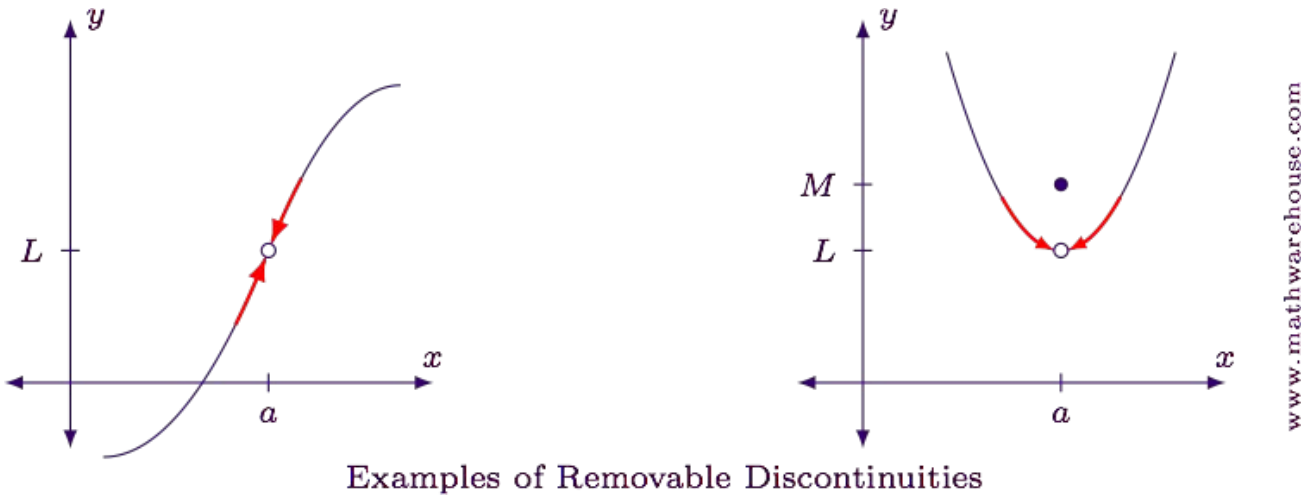


Types of discontinuity

1. Removable discontinuity
2. Jump discontinuity
3. Infinite discontinuity
4. Endpoint discontinuity

REMOVABLE DISCONTINUITY

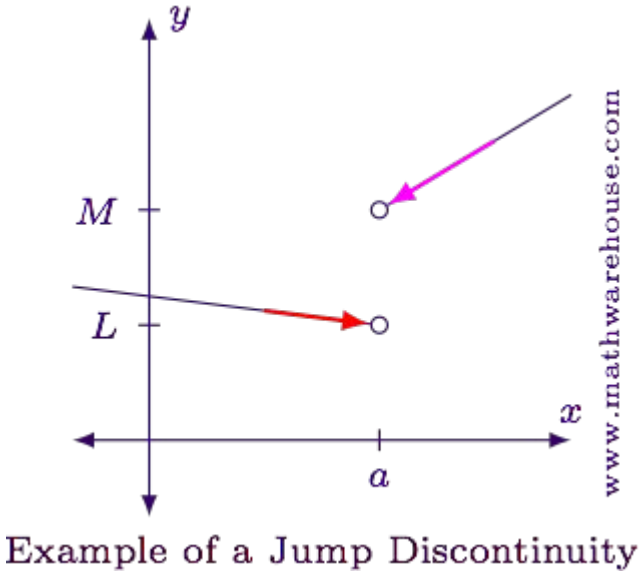
A removable discontinuity is a point at which a graph is not connected but can be made connected by filling in a single point.



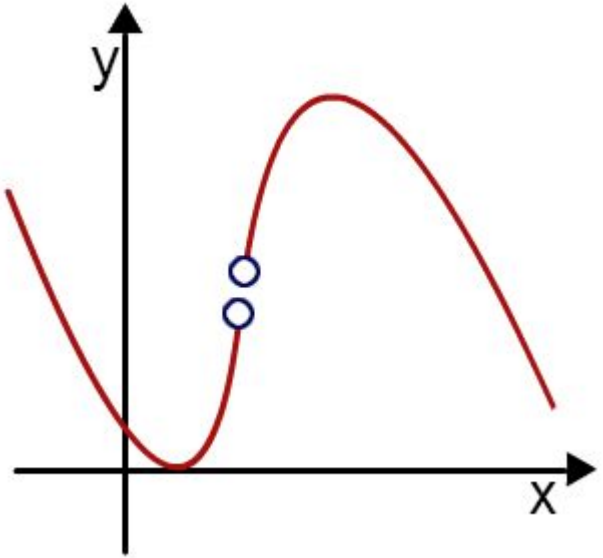
Examples of Removable Discontinuities

JUMP DISCONTINUITY

When the function is approaching different values depending on the direction x is coming from.

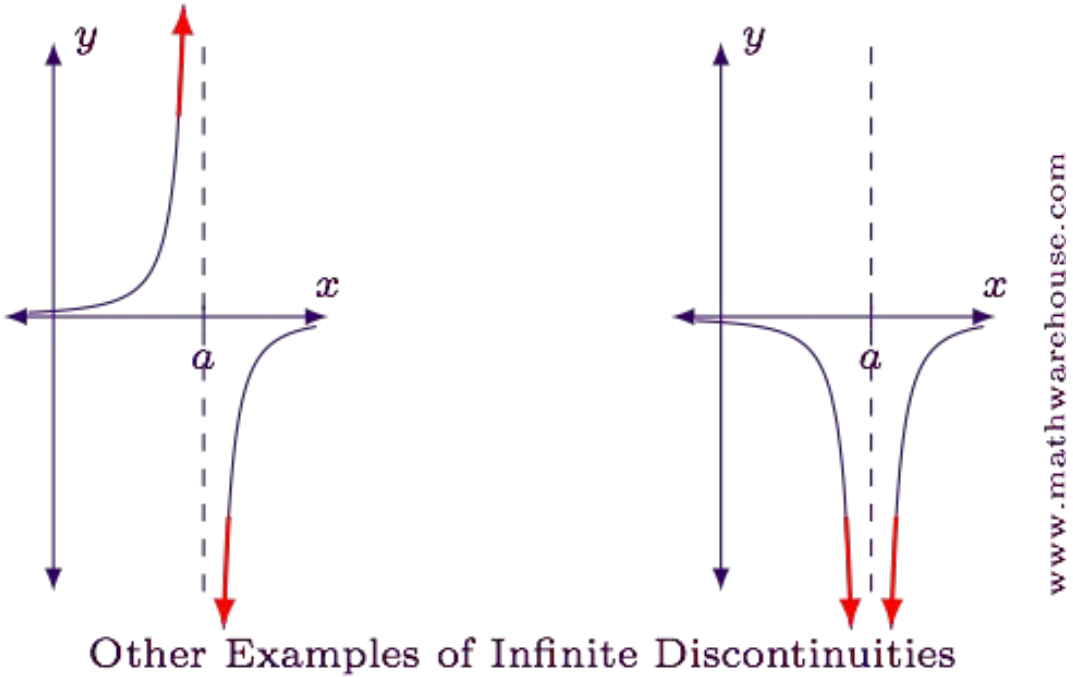


Example of a Jump Discontinuity



INFINITE DISCONTINUITY

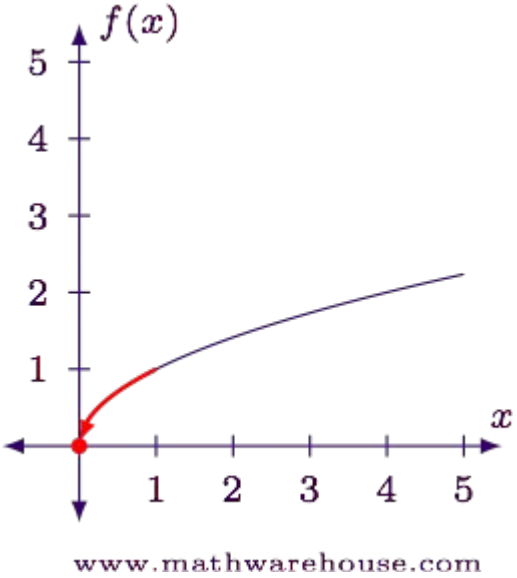
The arrows on the function indicate it will grow infinitely large as *x* approaches *a*. Since the function doesn't approach a particular finite value, the limit does not exist.

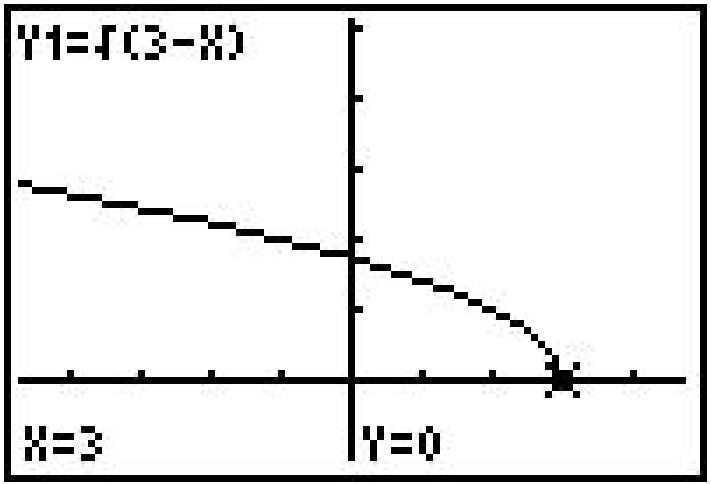


Other Examples of Infinite Discontinuities

ENDPOINT DISCONTINUITY

When a function is defined on an interval with a closed endpoint, the limit cannot exist at that endpoint. This is because the limit has to examine the function values as x approaches from both sides.





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