Advanced Derivative Rules
4.4 – Nondifferentiable Functions

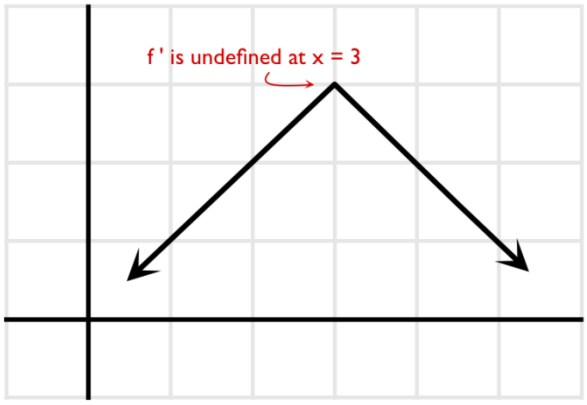
Thus far we have learned to find derivatives by the definition of derivative, the Power Rule, the Sum & Difference Rules, the Product Rule, the Quotient Rule, and the Chain Rule. However, there are functions that cannot be differentiated at certain values. These are called nondifferentiable functions. Knowing where a function is not differentiable is the focus of this section.

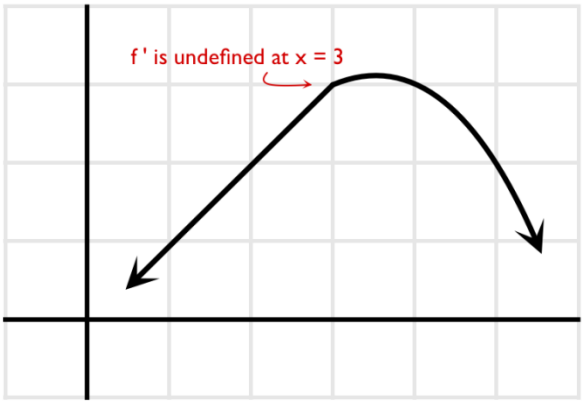
Summary of Nondifferentiable Functions

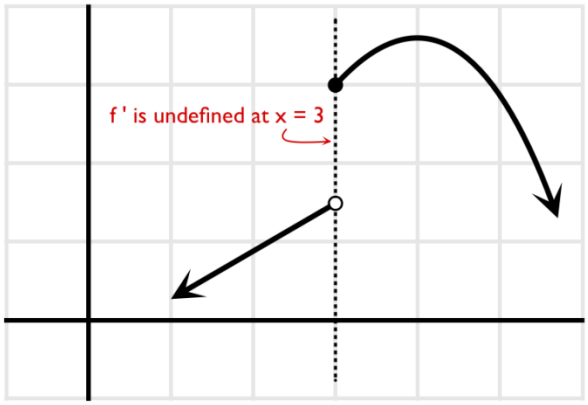
Therefore, if a function *f* satisfies any of the following conditions:

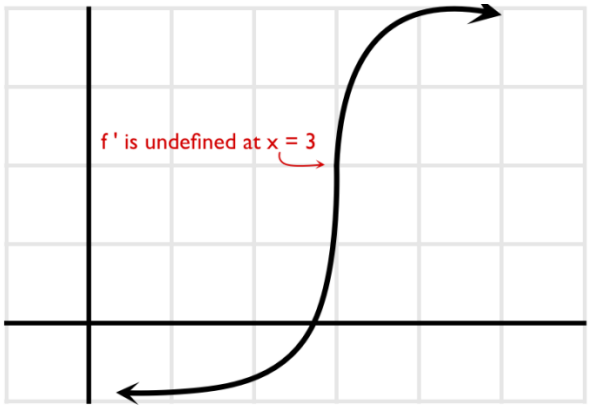
1. *f* has a corner point at $x = c$,
2. *f* has a vertical tangent at $x = c$,
3. *f* is discontinuous at $x = c$,

then *f* will not be differentiable at *c*.









Advanced Derivative Rules
4.4 – Nondifferentiable Functions

Ex A: Find the x-values at which the derivative is undefined.

Ex B: Graph $f(x) = |x|$ and show it's not differentiable at $x = 0$.