August 24, 2021 - Derivatives
[Parabolic]
Assume the graph is something generally parabolic, such as $f(t) = t^2$.
First, recall the second kinematic

Recall that for our tangent graphs (without the use of much calculs), we would find the slope of a secant line. We v

which would differ from the instantaneous velocity for the vast majority of the time.
As a result, we take

for

notice how this equation looks similar to $v = v_0 + at$
[Historical Context - Leibniz and Newton] Derivative - coined by "Leibniz."
Issues with naming it this way: derivative implies derivation, although the process itself of taking a derivative is dif
Δx was renamed from Δx to dx. The only real velocity equation according to most univeristy professors is

Then, the acceleration equation becomes

[Rules of Differentiation] A derivative is an expression that represents the rate of change of a function with respect
Constant Rule. Example: if $x = 6$, then $\frac{dy}{dx} = 0$.
Power rule:

[Example] What is the squirrel's acceleration at $t = 1$ second if its position is given by the equation $x = 2t^5 - 3t^2 +$