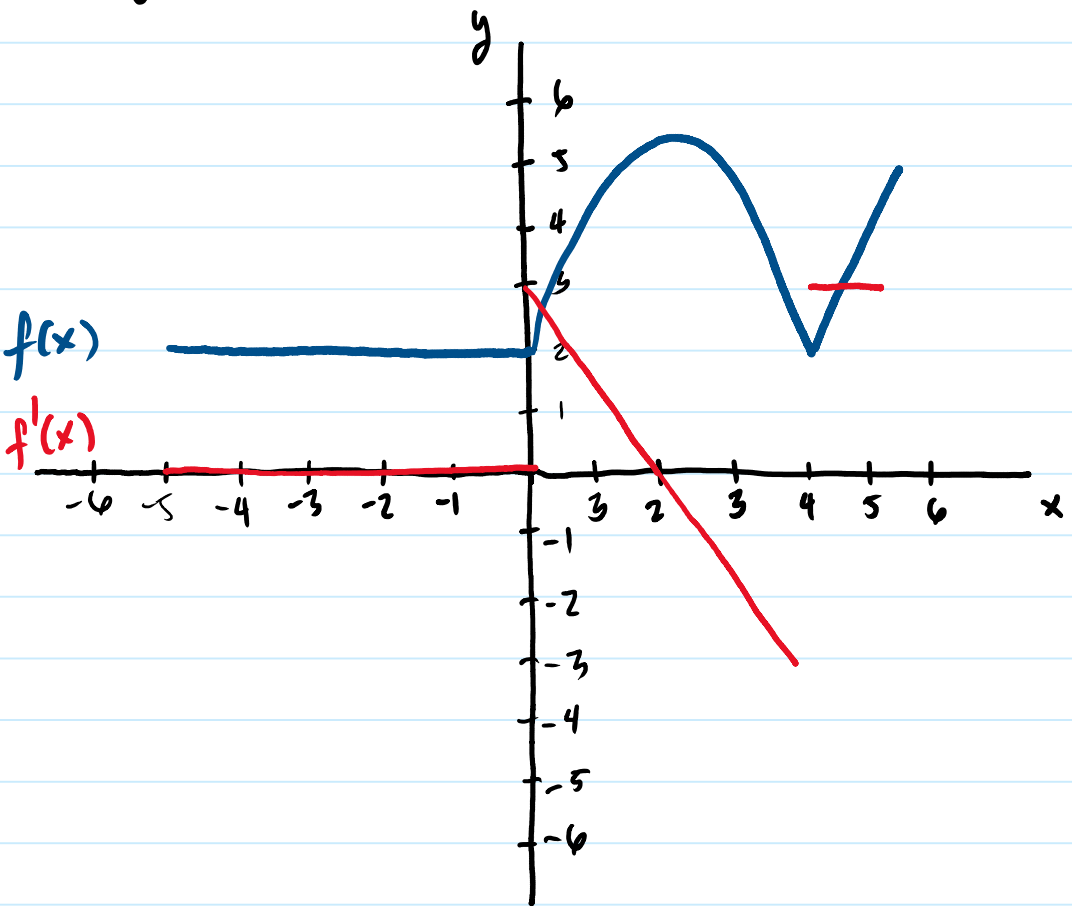
2.4 Interpreting the Derivative

Thursday, September 14, 2023

Objectives

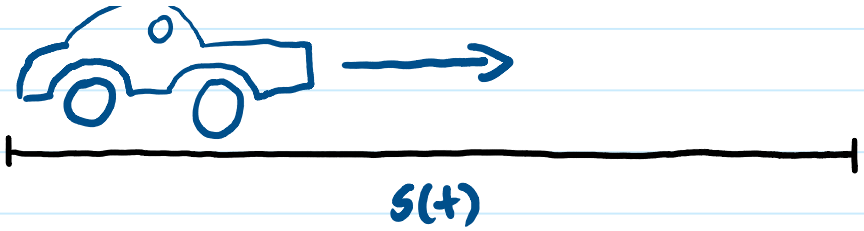
1. How to interpret the meaning of the derivative in context?
2. Inverse functions notations and introduction

Drawing Derivative Functions



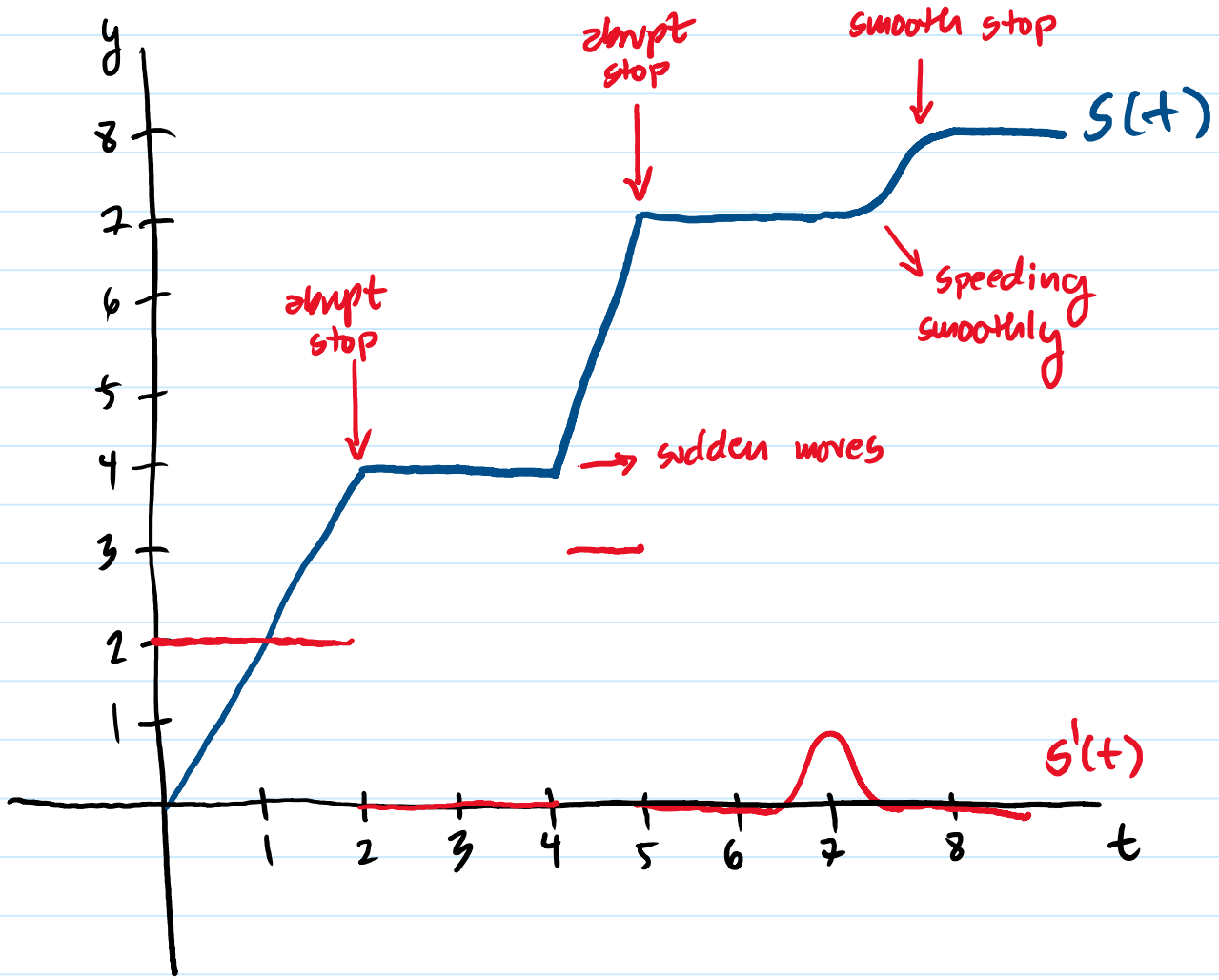
Derivatives with meaning

Scenario 1: Car driving on a straight road.

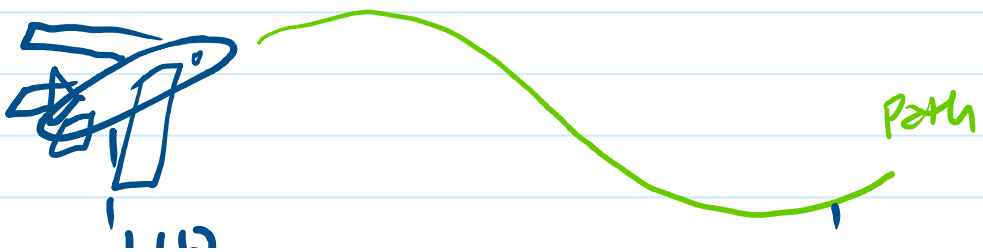


Let $t \rightarrow$ time in minutes

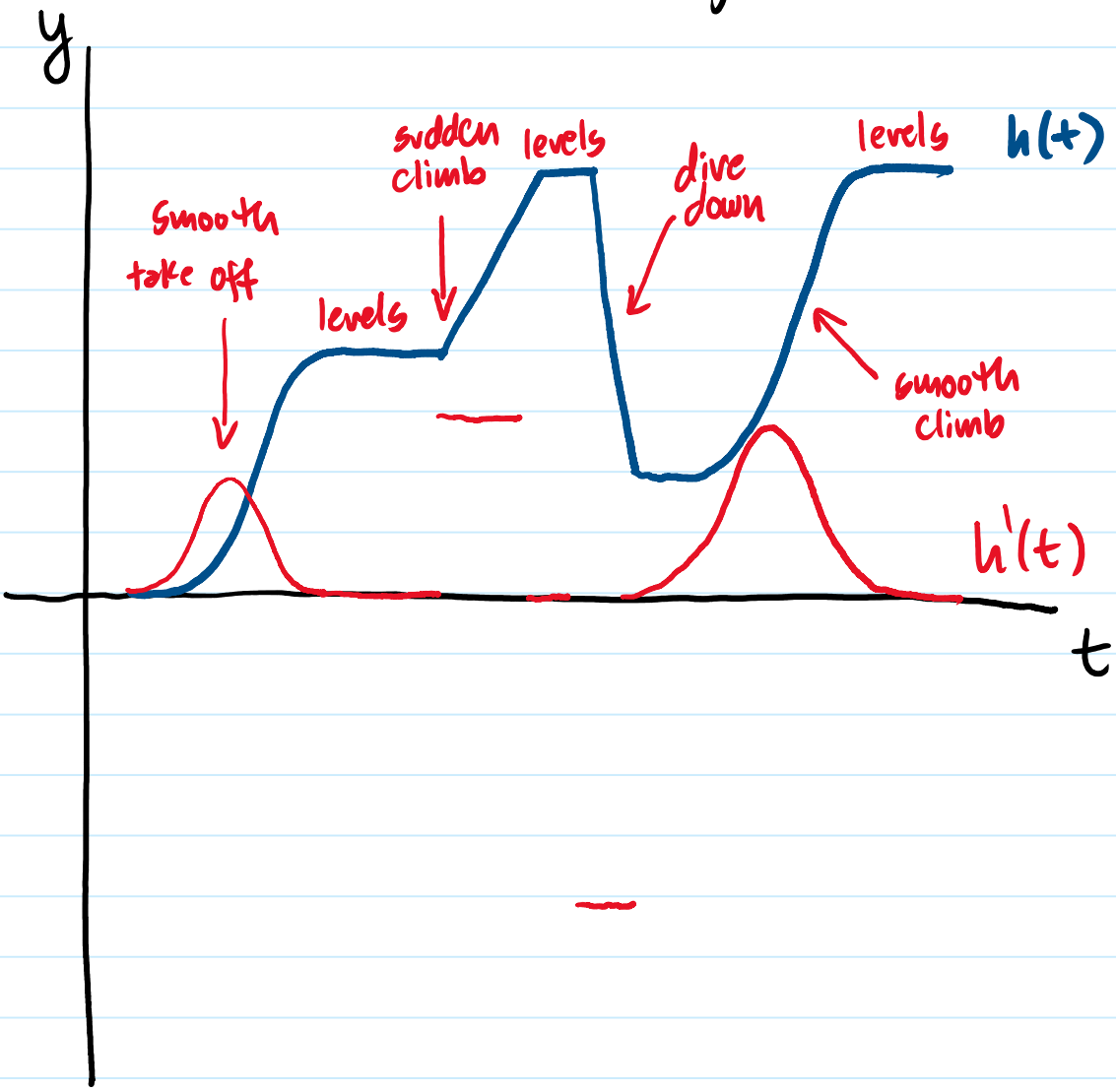
$s(t) \rightarrow$ car's position function at t in feet.



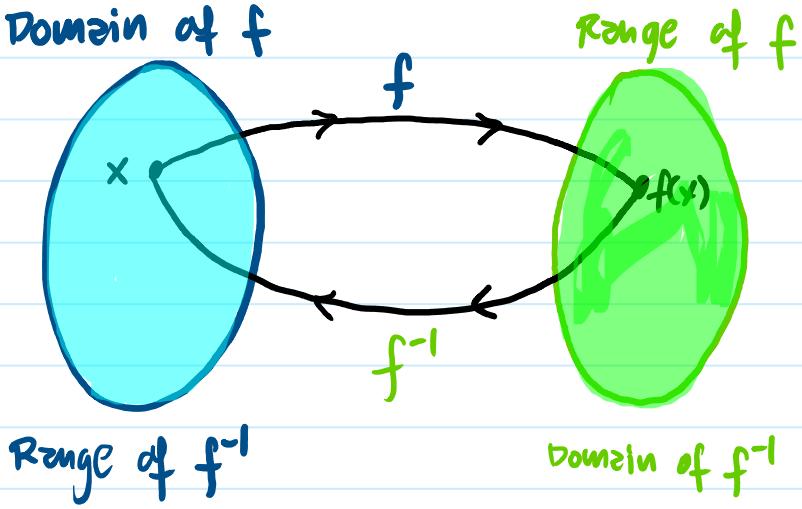
Scenario 2: Plane flying at a height.



Let $t \rightarrow$ be time in minutes
$h(t) \rightarrow$ be the height in meters.



Intuition on Inverse Functions



Notations: $f(x)$ → a function f of x

$f^{-1}(x)$ → inverse function of f of x (not meant $\frac{1}{f(x)}$)

Example:

- $f(1) = 2 \longrightarrow f^{-1}(2) = 1$

  input output input output

they "cancel" each other

$f(f^{-1}(2)) = f(1) = 2$

or

$f^{-1}(f(1)) = f^{-1}(2) = 1$

In general $f(f^{-1}(x)) = x$