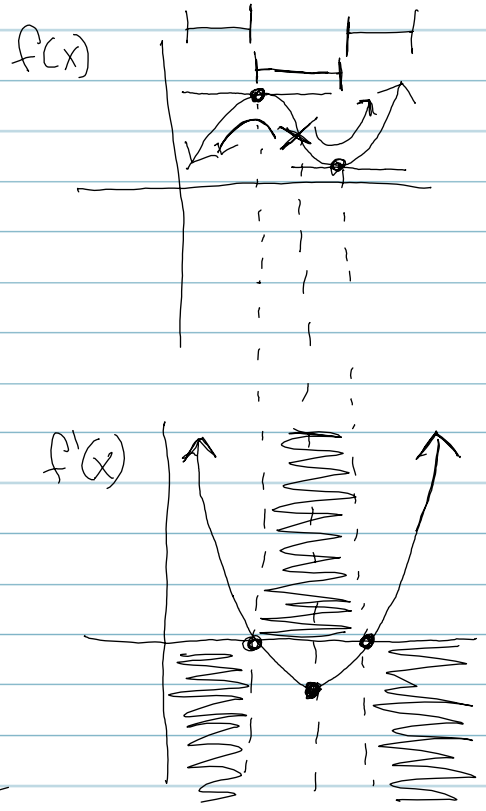
Derivative/Slope/Rate of Change Graphs

$f'(x)$ = slope of the tangent = instantaneous rate of change = the derivative = df/dx

They all ask for the same thing!

Basic Rules:

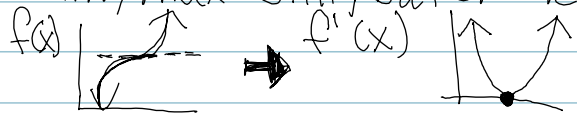


1.) Any relative minimum or maximum of $f(x)$ will become an x-intercept on $f'(x)$.

2.) An inflection point on $f(x)$ that is on an increasing slope will become a maximum on $f'(x)$.

3.) An inflection point on $f(x)$ that is on a decreasing slope will become a minimum on $f'(x)$.

- exception → if an inflection point has a slope of zero, it will become a min/max still, but on the x-axis



4.) Anywhere $f(x)$ is increasing, $f'(x)$ will be above the x axis.

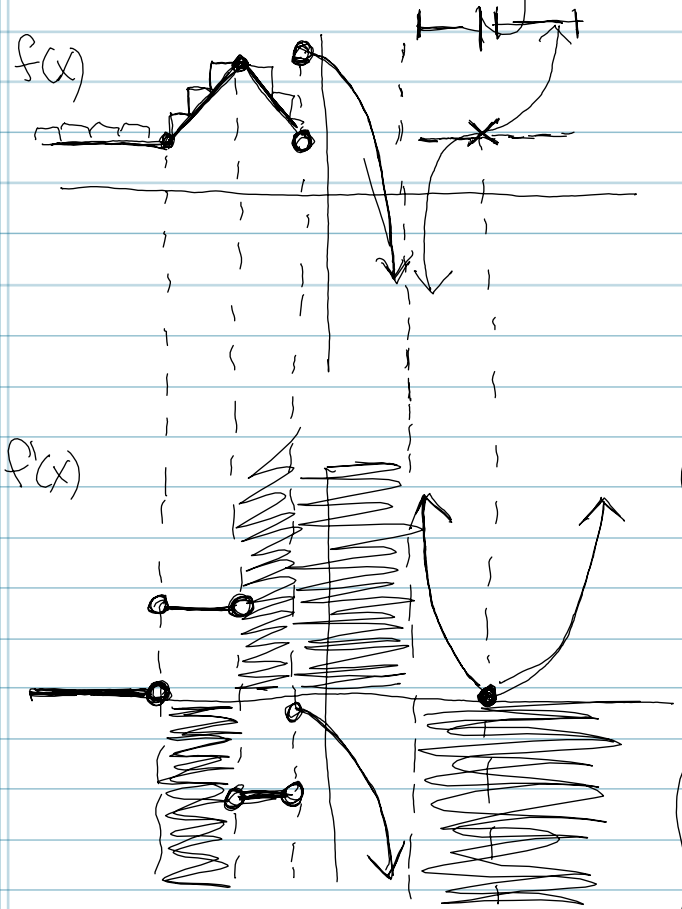
5.) Anywhere $f(x)$ is decreasing, $f'(x)$ will be below the x axis.

6.) Anywhere $f(x)$ is concave up, $f'(x)$ will be increasing.

7.) Anywhere $f(x)$ is concave down, $f'(x)$ will be decreasing.

Derivative / Slope / Rate of Change Graphs

Special / Confusing Cases



Try This!