Recall: The derivative of the function f(x) is:

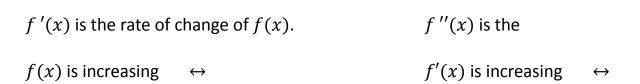
$$f'(x) = \lim_{\Delta x \to o} \frac{f(x + \Delta x) - f(x)}{\Delta x}$$

The derivative f'(x) is a function.

Since f'(x) is a function, we can take *its* derivative.

$$(f'(x))' =$$

$$f''(x)$$
 is called



Recall: f(x) is concave up if the rate of change of f(x) is increasing. f(x) is concave up if f'(x) is increasing

f(x) is concave up if

$$f(x)$$
 is decreasing \leftrightarrow $f'(x)$ is decreasing \leftrightarrow

Recall: f(x) is concave down if the rate of change of f(x) is decreasing. f(x) is concave down if f'(x) is decreasing

f(x) is concave down if

$$f(x)$$
 is concave up if $f''(x) > 0$ $f(x)$ is concave down if $f''(x) < 0$

f(x) f'(x)