

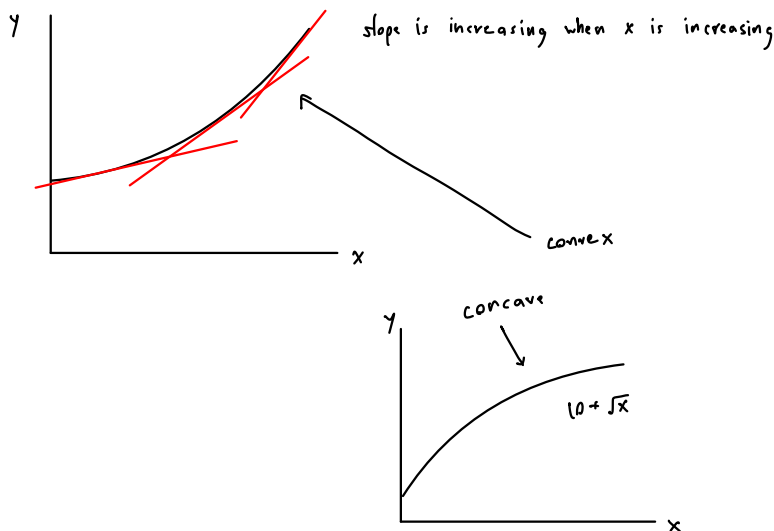
Second-order Derivative: Slope of Slope

$$y = f(x) = 10 + x^2$$

$$f'(x) = 2x$$

$$f''(x) = 2$$

Point	x	y	f'(x)	f''(x)
	0	10	0	2
A	1	11	2	2
B	2	14	4	2
C	3	19	6	2



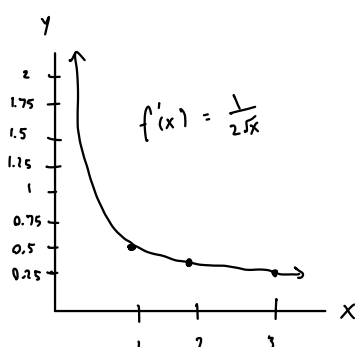
- The 2nd-order derivative indicates the curvature of the graph to be convex or concave.

HW Find the 2nd-order derivative of $y = f(x) = 10 + \sqrt{x}$ and fill in the table:

Point	x	y	f'(x)	f''(x)
	0	10		
A	1	11	$\frac{1}{2} = 0.5$	$-\frac{1}{4} = -0.25$
B	2	11.414	$\frac{\sqrt{2}}{4} = 0.3535$	-0.0933
C	3	11.732	$\frac{\sqrt{3}}{6} = 0.2887$	-0.0491

$$10 + \sqrt{x} \quad \left| \quad f'(x) = \frac{1}{2\sqrt{x}} \quad \right| \quad f''(x) = -\frac{1}{4x\sqrt{x}}$$

Plot the graph of y and $f'(x)$. Is $f'(x)$ linear?



Not linear

