

HW#3 Due Jan 25, 2022

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

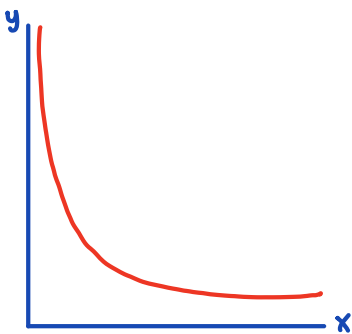
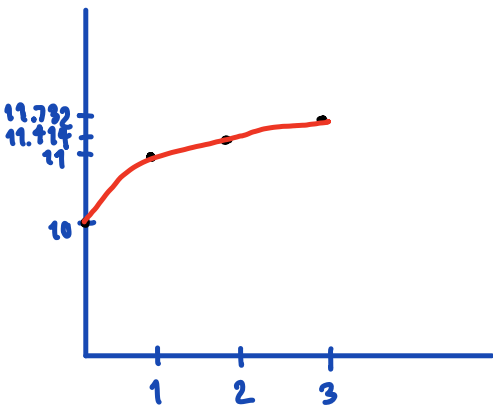
$y = 10 + \sqrt{x} \quad \frac{dy}{dx} = f'(x)$

Point	x	y	f'(x)	f''(x)
	0	10	undefined	undefined
A	1	11	$\frac{1}{2} = 0.5$	$-\frac{1}{4}$
B	2	11.414	0.354	-0.098
C	3	11.732	0.289	-0.049

$$f'(x) = \frac{1}{2} x^{-\frac{1}{2} - \frac{2}{2}} = \frac{1}{2}$$
$$= \frac{1}{2} \cdot \frac{1}{x^{\frac{1}{2}}}$$
$$= \frac{1}{2\sqrt{x}}$$

$$f''(x) = -\frac{1}{4} x^{-\frac{3}{2}}$$
$$= -\frac{1}{4} \cdot \frac{1}{x^{\frac{3}{2}}}$$
$$= -\frac{1}{4\sqrt{x}}$$

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



$\therefore f'(x)$ is not linear