

HW#3 Due Jan 25, 2022

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

Point	$x$	$y$	$f'(x)$	$f''(x)$
	0	10	0	0
A	1	11	0.5	-0.25
B	2	11.414	0.3536	-0.1764
C	3	11.732	0.2447	-0.1443

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

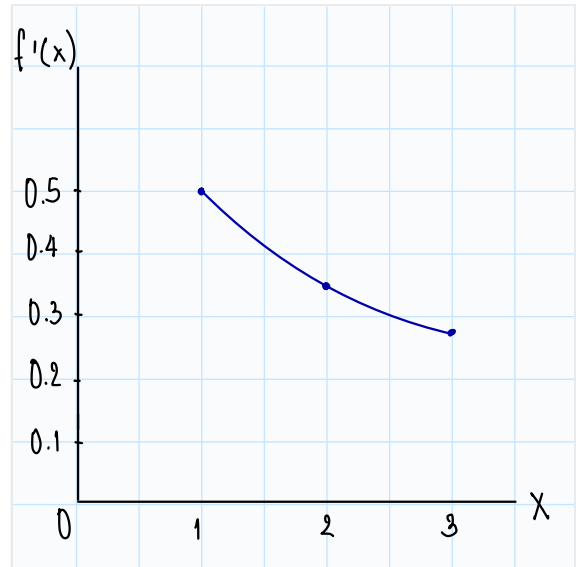
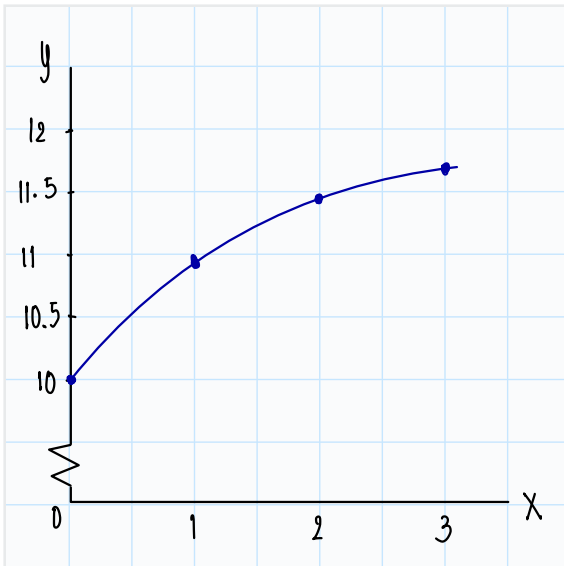
$$f''(x) = n(n-1)x^{n-2}$$

$$= \frac{1}{2} \left( \frac{1}{2} - 1 \right) x^{\frac{1}{2} - 2}$$

$$= -\frac{1}{4} \cdot x^{-\frac{3}{2}}$$

$$= -\frac{1}{4\sqrt{x}}$$

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



$f'(x)$  is not linear #