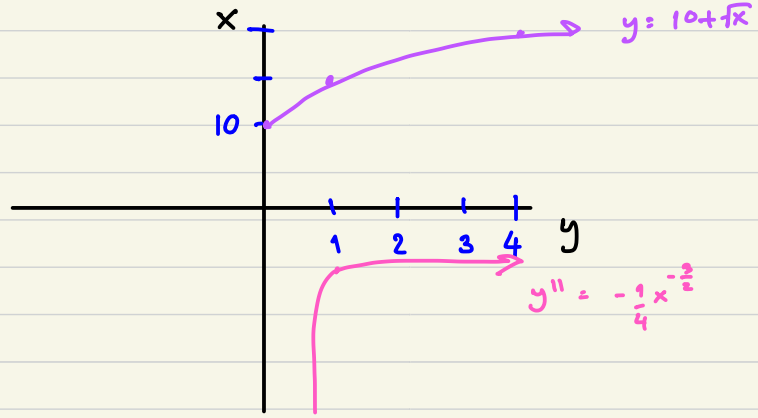
Homework 2

Find 2nd order derivative of $y = 10 + \sqrt{x}$ and plot the graph of y and $\frac{dy}{dx}$

Is the slope of slope a constant?

$$y = 10 + \sqrt{x}$$

$$\frac{dy}{dx} = \frac{1}{2\sqrt{x}} \qquad \frac{d}{dx}\left(\frac{dy}{dx}\right) = -\frac{1}{4}x^{\frac{3}{2}}$$



Homework 1

$y = 10 + \sqrt{x}$

$\frac{dy}{dx} = \frac{1}{2\sqrt{x}}$

x	y	dy/dx
0	10	undefined
1	11	0.5
2	11.41	0.35
3	11.73	0.29

as $x = 2$, $y = 11.41$ (slope 0.35355)

$\Delta x = 0.1$ x increases from 2 to 2.1

$\Delta y \approx \frac{dy}{dx} \cdot \Delta x$

$\approx 0.35355\,(0.1) = 0.035355$

actual $x = 2.1$, $y = 10 + \sqrt{2.1} = 11.44913767$

$\therefore \Delta y = 11.44913767 - 11.41 = 0.03913767$

$\Delta x = 0.2$

$\Delta y \approx \frac{dy}{dx} \cdot \Delta x \approx 0.35355(0.2)$

$= 0.07071$

actual $x = 2.2$, $y = 10 + \sqrt{2.2}$

$= 11.4832$

$\therefore \Delta y = 11.4832 - 11.47$

$= 0.0739$