HW#3 Due Jan 25, 2022

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

$f'(x) = \frac{1}{2\sqrt{x}} \longrightarrow f''(x) = \frac{1}{2}\left(\frac{1}{x^{1/2}}\right)$

$= \frac{1}{2} x^{-1/2}$

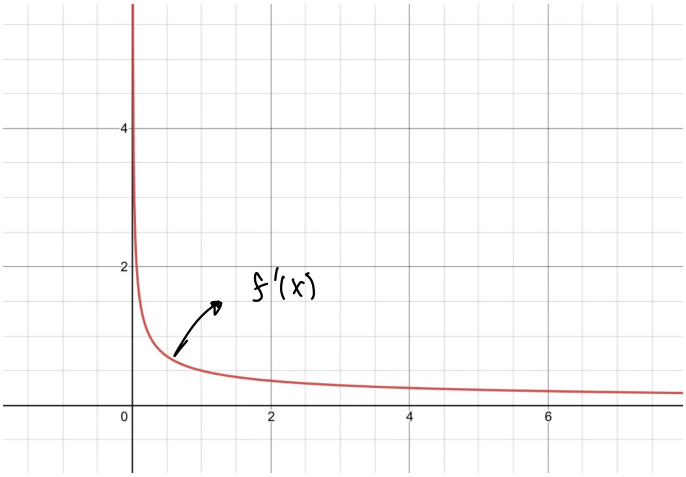
$= -\frac{1}{4} x^{-3/2}$

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

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

| Point | $x$ | $y$ | $f'(x)$ | $f''(x)$ |
|---|---|---|---|---|
| | 0 | 10 | undefined | undefined |
| A | 1 | 11 | $\frac{1}{2}$ | $-\frac{1}{4}$ |
| B | 2 | 11.414 | $\frac{1}{2\sqrt{2}}$ | $-\frac{\sqrt{2}}{16}$ |
| C | 3 | 11.732 | $\frac{1}{2\sqrt{3}}$ | $-\frac{\sqrt{3}}{36}$ |

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




$f'(x)$ is not linear!