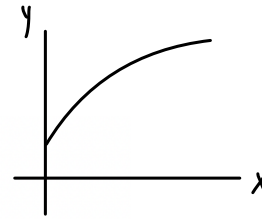


HW#2 Due Jan 20, 2022

only positive value

**HW** Given $y = 10 + \sqrt{x}$, $\approx f(x) = 10 + x^{\frac{1}{2}}$ a) Find the derivative $f'(x)$.

b) Fill in the table

Point	X	Y	$f'(x)$
	0	10	
A	1	11	$\frac{1}{2}$
B	2	11.414	$\frac{\sqrt{2}}{4}$
C	3	11.732	$\frac{\sqrt{3}}{4}$

c) Does the slope increase as x increases?d) Approximate the change in Y when $\Delta x = 0.2$ at $x_1 = 3$. Is the approximation under- or over-estimate?

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

c) No, it doesn't

d) Approximation

$$\Delta y \approx f'(x) \cdot \Delta x$$

$$= \frac{1}{2\sqrt{3}} (0.2)$$

$$= \frac{\sqrt{3}}{30}$$

$$\approx 0.058$$

real Δy

$$y_2 = f(3.2) = 10 + \sqrt{3.2} = 11.789$$

$$\Delta y = y_2 - y_1 = 11.789 - 11.732 = 0.057$$

$\therefore$ The approximation is overestimate the real Δy .