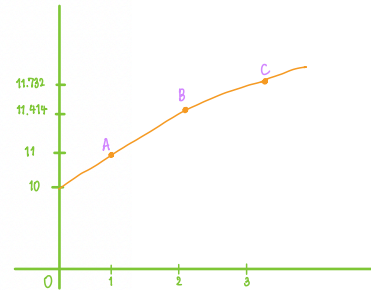


HW#2 Due Jan 20, 2022

HW Given $y = 10 + \sqrt{x}$,

- a) Find the derivative $f'(x)$.
 b) Fill in the table

Point	X	Y	$f'(x)$
	0	10	—
A	1	11	0.5
B	2	11.414	0.36
C	3	11.732	0.29



- 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?

c) When x increases, the slope decreases

a) $y = 10 + \sqrt{x}$
 $y = \frac{1}{2} x^{\frac{1}{2}}$

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

d) $\Delta y = f'(x) \cdot \Delta x$

$\Delta y = \frac{1}{2\sqrt{x}} \cdot 0.2$

$\Delta y = \frac{1}{2\sqrt{3}} \cdot 0.2$

$\Delta y = 0.29 \cdot 0.2$

$\Delta y = 0.0578$

$y_1 = f(3) = 11.732$

$y_2 = 11.732 + 0.0578$

$y_2 = 11.7898$

The real Δy

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

$y_2 - y_1 = 11.789 - 11.732 = 0.057$

$\therefore$ We overestimate the real change of y .