HW#2 Due Jan 20, 2022

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

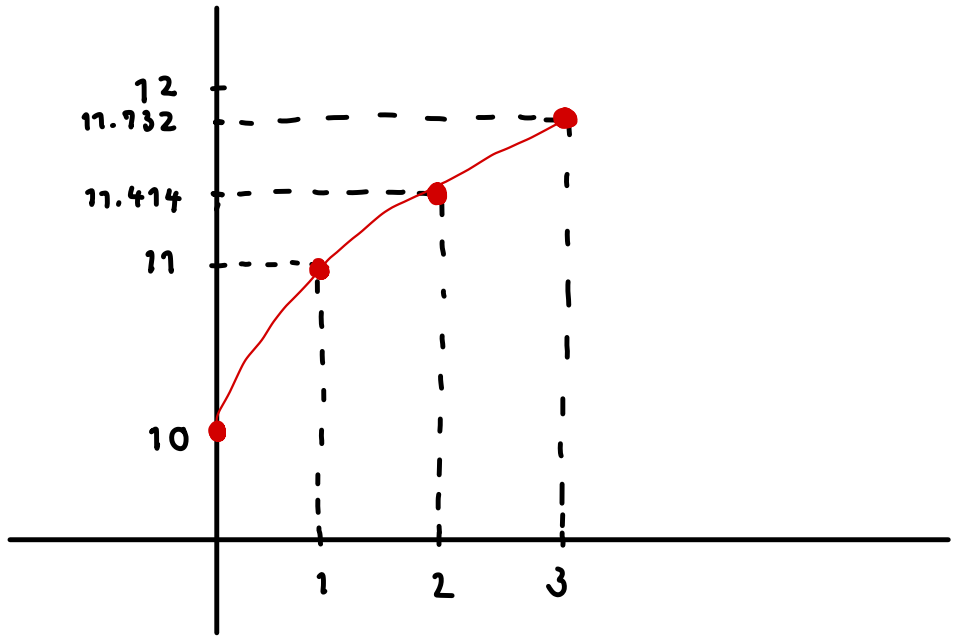
a) Find the derivative $f'(x)$.

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?



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

c) No slope decrease

× increase

d) $x_1 = 3$
$\Delta x = 0.2$
$x_2 = 3.2$

$\Delta y = f'(x_1) \cdot \Delta x$
$= f'(3) \cdot 0.2$
$= \frac{1}{2\sqrt{3}} \cdot 0.2$
$= 0.058$

$y_2 = f(3.2) = 10 + \sqrt{3.2} = 11.79$

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

∴ overestimate