

HW#2 Due Jan 20, 2022

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

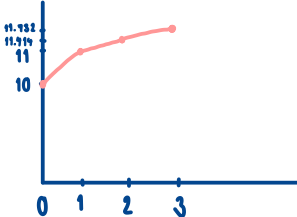
- a) Find the derivative $f'(x)$. $\frac{1}{2\sqrt{x}}$
b) Fill in the table

Point	X	Y	$f'(x)$
	0	10	Does not exist
A	1	11	$\frac{1}{2} = 0.5$
B	2	11.414	0.354
C	3	11.732	0.289

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

$y = 10 + \sqrt{x}$

a) $f'(x) = 0(10)^{-1} + \frac{1}{2}x^{-\frac{1}{2}}$
 $= 0 + \frac{1}{2} \cdot \frac{1}{\sqrt{x}}$
 $= \frac{1}{2\sqrt{x}}$



c) From the graph, the slope decrease

d)

<u>Estimate ΔY</u>	<u>Real ΔY</u>	$\Delta x = 0.2$
$\Delta y = f'(x) \cdot \Delta x$	$x_1 = 3$	$x_1 = 3$
$= 0.289 \cdot 0.2$	$x_2 = 3.2$	
$= 0.0578$	$y_1 = f(3.2) = 10 + \sqrt{x}$	
	$y_2 = 11.789$	
	$y_2 - y_1 = 11.789 - 11.732$	
	$= 0.057$	

$\therefore$ Estimate $\Delta Y >$ Real ΔY
So, the approximation over-estimated