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	1
B	2	11.414	0.707
C	3	11.732	0.577

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) slope $= \frac{dy}{dx} = f'(x) = \frac{1}{\sqrt{x}}$

(c) No, the slope decrease as X increase, slope > 0

(d) Approximate

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

$\Delta y \approx f'(1)(0.2)$

$\Delta y \approx 0.1154$

Real

$x_1 = 3$

$x_2 = 3.2$, $y_1 = 11.732$

$y_2 = f(3.2)$

$= 10 + \sqrt{3.2}$

$= 11.789$

$\Delta y = y_2 - y_1$

$= 0.057$

Ans The approximation is over estimate