only ⊕ part

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	
B	2	~~14~~ 11.414	
C	3	~~19~~ 11.732	

c) Does the slope increase as x increase?

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

Note: If the function $f(x)$ is linear, the approximation is exact.

a.) $f(x) = 10 + \sqrt{x}$

$= 10 + (x)^{\frac{1}{2}}$

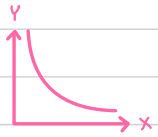
$f'(x) = \frac{x^{-\frac{1}{2}}}{2}$

$= \frac{1}{2(x)^{\frac{1}{2}}}$ or $\frac{1}{2\sqrt{x}}$

b.)

Point	X	Y	$f'(x)$	
	0	10	DNE	
A	1	11	$1/2$	$= 0.5$
B	2	~~14~~ 11.414	$1/2\sqrt{2}$	≈ 0.35
C	3	~~19~~ 11.732	$1/2\sqrt{3}$	≈ 0.28

c.) No, the slope decrease as x increase



d.) Approximate : $\Delta y = f'(x_1) \cdot \Delta x$; $\Delta x = 0.2$ at $x_1 = 3$

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

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

$= 0.05\overline{77}$

Real Δy : $y_2 = f(3.2) = 10 + \sqrt{3.2}$

$\Delta y = y_2 - y_1$

$= (10 + \sqrt{3.2}) - (10 + \sqrt{3})$

≈ 0.0568