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

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

b) Fill in the table

Point	X	Y	$f'(x)$
	0	10	0
A	1	11	0.5
B	2	11.414	0.35
C	3	11.732	0.29

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?

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

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

$= \frac{1}{2\sqrt{x}}$ ※

c) No because slope and x have negative relationship ※

d) For real ΔY

$\Rightarrow \Delta Y = Y_2 - Y_1$

$= (10 + \sqrt{3} \cdot 2) - (10 + \sqrt{3}) = \boxed{0.0568}$

∴ $0.0577 > 0.0568$, which mean the approximation is over-estimate ※

For approximation

$\Rightarrow \Delta y = f'(x_1) \cdot \Delta x$

$= \frac{1}{2\sqrt{3}} \cdot 0.2 = \boxed{0.0577}$