

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	0.35
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?

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

c). No, When $x \uparrow$, slope will $\downarrow$.

d.)

$$\begin{aligned}\Delta y &= f'(x)(\Delta x) \\ &= (0.29)(0.2) \\ &= 0.058\end{aligned}$$

$$\begin{aligned}Y_2 &= f(3.2) \\ &= 10 + \sqrt{3.2} \\ &= 11.789 \\ \Delta Y &= Y_2 - Y_1 \\ &= 11.789 - 11.732 \\ &= 0.057\end{aligned}$$

The approximation is over-estimate.