

- HW** Given $y = 10 + \sqrt{x}$,
 a) Find the derivative $f'(x)$. Ans.
 b) Fill in the table

$$\frac{dy}{dx} = f'(x) = \frac{x^{-\frac{1}{2}}}{2} \rightarrow \frac{1}{2\sqrt{x}}$$

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?

No, When x increases, Slope decreases.

Approximation.

$$\Delta y \approx f'(x_1) \cdot \Delta x = 0.29 \cdot 0.2 = 0.058$$

Actual.

$$y_2 = f(3.2) = 10 + \sqrt{3.2} = 11.789$$

$$\therefore \Delta y = y_2 - y_1 = 11.789 - 11.732 = 0.057$$



Ans. The approximation is over-estimate.