

HW#2 Due Jan 20, 2022

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

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

$$\frac{1}{\sqrt{2}}$$

- Does the slope increase as x increases?
- Approximate the change in Y when $\Delta x = 0.2$ at $x_1 = 3$. Is the approximation under- or over-estimate?

a)

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

c.) No, the slope decrease as x increases, slope > 0

d.) Approximate

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

$$\Delta y \approx f'(3) (0.2)$$

$$\Delta y \approx 0.1154$$

Real

$$x_2 = 3.2, \quad x_1 = 3$$

$$y_1 = 11.732$$

$$y_2 = f(3.2)$$

$$= 10 + \sqrt{3.2}$$

$$= 11.789$$

$$\Delta y = y_2 - y_1$$

$$= 0.057$$

Ans. The approximation is over estimate.