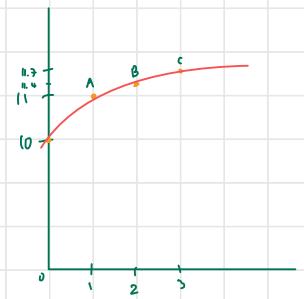


HW Given $y = 10 + \sqrt{x}$, ↖ only positive

- a) Find the derivative $f'(x)$.
- b) Fill in the table

Point	X	Y	$f'(x)$
	0	10	
A	1	11	$1/2$
B	2	11.414	$1/2 \cdot 0.284$
C	3	11.732	$1/2 \cdot 0.664$

- c) Does the slope increase as x increases?
- 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.

Ⓐ $\frac{d}{dx}(\sqrt{x}) = \frac{1}{2\sqrt{x}}$

Ⓑ No, the slope decrease.

Ⓒ $\Delta y \approx f'(x) \cdot \Delta x$ real Δy ; $y_1 = 11.732$
 $f'(3) \cdot 0.2$ $= y_2 - y_1$
 $= \frac{1}{2\sqrt{3}} \cdot 0.2$ $y_2 = 10 + \sqrt{3 \cdot 2}$
 $= 0.05773$ $y_2 = 11.7888543$

real $\Delta y = y_2 - 11.732 = 0.05685$

∴ we overestimate the real change of y