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HW#2 Due Jan 20, 2022

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	$1/2$
B	2	11.414	$\sqrt{2}/4$
C	3	11.732	$\sqrt{3}/6$

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?

a) $10 + \sqrt{x}$

$\frac{dy}{dx}\ x^{\frac{1}{2}}$

$\frac{dy}{dx}\ \frac{1}{2}x^{-\frac{1}{2}}$

$= \frac{1}{2}x^{-\frac{1}{2}}$

c) NO slope does not increase as x increases.

d) $\Delta Y = \frac{1}{2}(3)^{-\frac{1}{2}} \times 0.2$

$= \frac{\sqrt{3}}{30}$ ≈ 0.057735

Check for ΔY $\quad x_2 = 3.2$

① $Y_2 = 10 + \sqrt{3.2} = 11.7889$

② $\Delta Y = 11.7889 - 11.732$

$= 0.0569$

ANS under-estimate