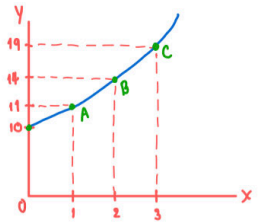
only positive part

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

a) Find the derivative $f'(x)$. $\frac{dy}{dx} = f'(x) = \frac{1}{2}x^{-\frac{1}{2}} = \frac{1}{2\sqrt{x}}$

b) Fill in the table

Point	X	Y	$f'(x)$
	0	10	-
A	1	11	0.5
B	2	14	0.35
C	3	19	0.29



c) Does the slope increase as x increase? No, because when x increases, slope decreases.

d) Approximate the change in Y when $\Delta x = 0.2$ at $x_1 = 3$. Is the approximation under- or over-estimate? $\Delta y \approx f'(x_1) \cdot \Delta x$

$= f'(3) \cdot 0.2 = \frac{1}{2\sqrt{3}} \cdot 0.2 \approx 0.0577$

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

$x_1 = 3$, $y_1 = 10 + \sqrt{3} \approx 11.7321$

the real Δy : $y_2 = f(3.2) = 10 + \sqrt{3.2} \approx 11.7889$

$\Delta y = y_2 - y_1 = [(10 + \sqrt{3.2}) - (10 + \sqrt{3})]$

$= 11.7889 - 11.7321$

$= 0.0568$

∴ The approximation is overestimate.

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