HW#2 Solution

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

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

b) Fill in the table

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 increases? No, the slope decreases 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?

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

Actual change can be found from

$f(3) = 11.732$.

$f(3.2) = 10 + \sqrt{3.2} = 11.788$

$\therefore$ actual change $\Delta y = f(3.2) - f(3)$

$= 11.788 - 11.732$

$= 0.056 < 0.058$

The approximation is overestimated