Pitthawat 6304641134

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

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

b) Fill in the table

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

$\frac{\sqrt{1}}{2} = 0.5$

$\frac{\sqrt{2}}{4} = 0.35$

$\frac{\sqrt{3}}{6} = 0.29$

c) Does the slope increase as x increase? no, it decreases

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

; $y = 10 + \sqrt{x}$

a.) derivative $f'(x)$

$f(x) = 10 + \sqrt{x}$

$f(x) = 10 + x^{\frac{1}{2}}$

$f'(x) = \frac{1}{2}x^{-\frac{1}{2}}$

$= \frac{1}{2(x^{\frac{1}{2}})}$

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

$= \frac{1}{2\sqrt{x}} \cdot \frac{\sqrt{x}}{\sqrt{x}}$

$\therefore$ Ans $= \frac{1}{2\sqrt{x}}$ or $\frac{\sqrt{x}}{2x}$ #

d.) when $\Delta x = 0.2$ at $x_1 = 3$

- Approximation

$\Delta y = f'(x_1) \cdot \Delta x$

$= \frac{1}{2\sqrt{3}} \cdot 0.2$

$= 0.0577$

- Real Δy

$x_1 = 3$, $\Delta x = 0.2$ } $3 + 0.2 = 3.2$

$y_2 = f(3.2) = 10 + \sqrt{x}$

$= 10 + \sqrt{3.2}$

$\Delta y = y_2 - y_1$

$= (10 + \sqrt{3.2}) - (10 + \sqrt{3})$

$= 0.0568$

$\therefore$ The approximation is overestimate