AOD

Approximation :-

i) Identify the function.

ii) $\left[f(a+h) = f(a) + h \cdot f'(a) \right]$

Ex :- Find $\sqrt{36.6} = ?$ (approx.)

Sol^n :- $f(x) = \boxed{y = \sqrt{x}} \longrightarrow (i)$

Here $a = 36$ & $h = 0.6$

ii) sol $f(a+h) = f(a) + h \cdot f'(a)$

$$\left[f(36 + 0.6) = f(36) + 0.6 \cdot f'(36) \right]$$

from eq. ① :- $y = f(x) = \sqrt{x}$

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

$$\therefore f'(36) = \frac{1}{2\sqrt{36}} = \frac{1}{2\times 6} = \frac{1}{12}$$

& $f(36) = \sqrt{36} = 6$

$$\Rightarrow f(36.6) = 6 + \frac{0.6}{10} \times \frac{1}{12}$$

$$f(36.6) = 6 + \frac{1}{20}$$

$$f(36.6) = 6 + 0.05$$

$$\Rightarrow \boxed{\sqrt{36.6} = 6.05} \text{ Ans}$$

AOD

Approximation:-

i) Identify the function.

ii) $\left[f(a+h) = f(a) + h\cdot f'(a)\right]$

$$\begin{array}{r} 0.8 \\ 0.8 \\ \hline \end{array} \quad 0.64$$

$\sqrt{25} = 5$

Q x 1 - ① $\sqrt{25.3}$

Sol^n:- let $y = f(x) = \sqrt{x}$

Then $\Rightarrow a = 25$ & $h = 0.3$

Now: $f(a+h) = f(a) + h\cdot f'(a)$

$\rightarrow f(25+0.3) = f(25) + h\cdot f'(25)$ — ①

$\rightarrow$ ~~$f(25.3) =$~~

$\because f(x) = \sqrt{x} \rightarrow f(25) = \sqrt{25} = 5$ — ②

& $f'(x) = \dfrac{1}{2\sqrt{x}} \Rightarrow f'(25) = \dfrac{1}{2\sqrt{25}} = 0.1$ — ③

from eq^n ① ② & ③ !- $f(25.3) = 5 + 0.3 \times 0.1$

$\sqrt{25.3} = \boxed{5.03}$ Ans

② $\sqrt{0.6}$ $\Rightarrow$ let $\boxed{f(x) = \sqrt{x}}$

.20

Then $a = 1$ & $h = -0.4$

$\therefore f(a+h) = f(a) \pm h\cdot f'(a)$

so $\left[f(1-0.4) = f(1) - 0.4\cdot f'(1)\right]$

$\rightarrow f(0.6) = 1 - 0.4 \times 0.5$

$\therefore f(x) = \sqrt{x} \Rightarrow f(1) = \sqrt{1} = 1$

& $f'(x) = \dfrac{1}{2\sqrt{x}} \Rightarrow f'(1) = \dfrac{1}{2\sqrt{1}} = \dfrac{1}{2} = 0.5$

$\rightarrow f(0.6) = 1 - 0.2$

$\boxed{\sqrt{0.6} = 0.8}$ Ans