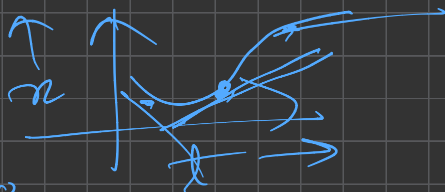
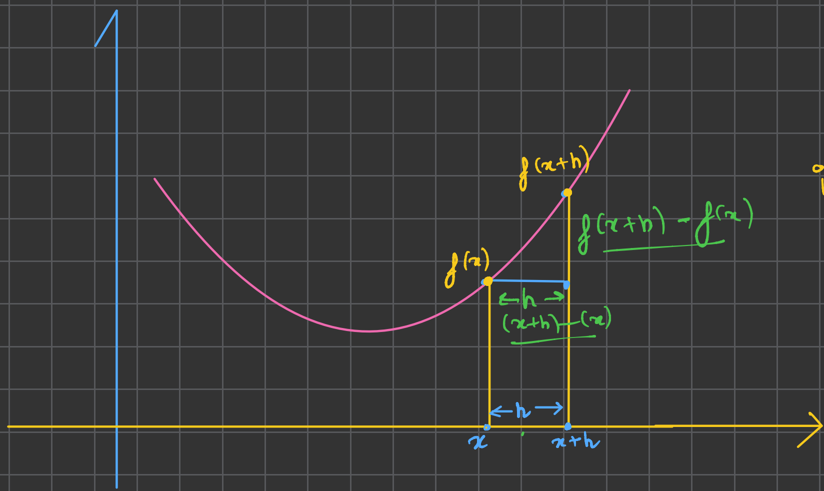
Differentiation

$v = \boxed{x/t}$ km/hr

$dv = dx/dt$ → v value.



time terms



Function

input (x) → $\boxed{f}$ → output $f(x) = y$

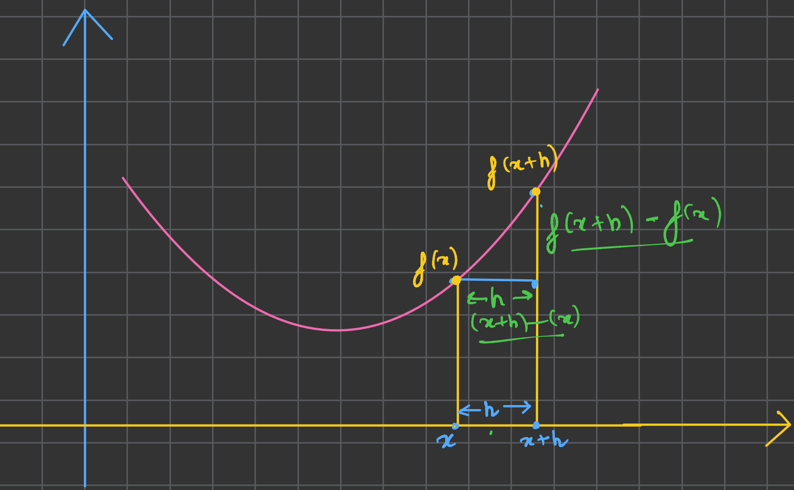
$f(x) = x^2 + 2$
$x = 1,$
$f(x) = 3 = y$

$$f'(x) = \frac{f(x+h) - f(x)}{(x+h) - (x)} = \boxed{\frac{f(x+h) - f(x)}{h} = f'(x)}$$

(slope)

(Assuming h is very small → 0)

We will see, this slope analytically & mathematically.



condition 1 :-

1) x is +ve.

$x \to (x+h)$

which will be greater

$f(x+h)\uparrow$ or $f(x)\uparrow$

$f(x+h) > f(x)$

By Defn slope is the sensitivity of the measure of change of funn w.r.t. input.

$\boxed{\text{The slope of above funn is +ve. ∴ so if h is added to x, then funn will definety increase.}}$ ✓ Analytical observation

$$\boxed{\begin{array}{l} y = f(x) \rightarrow \text{Polynomical} \\ x^n = \boxed{nx^{n-1}} \rightarrow \dfrac{dy}{dx} \end{array}}$$

Calculus

$\Rightarrow$

condition 2:-

1) x is -ve:-

$x \to (x+h)$

which will be greater

$f(x+h)\uparrow$ or

$f(x)\uparrow$

$f(x+h) < f(x)$

By Defn slope is the sensitivity of the measure of change of funn w.r.t. input.

The slope of above funn is -ve.

so, if h is added to x, then funn will definety decrease

Analytical observation

$y = f(x) \to$ Polynomial

$x^n = \boxed{nx^{n-1}} \to \frac{dy}{dx}$

Calculus

x, x.grad, f(x)

x.grad > 0 , $f(x+h)\uparrow$

x.grad < 0 $f(x+h)\downarrow$

Analytical