
DSSSB TGT
PART(A+B)
MATHS
APPLICATION OF DERIVATIVES
Part -3
LIVE
11/06/2024 04:30PM

स्पर्श रेखा का समीकरण

Equation of Tangent :→

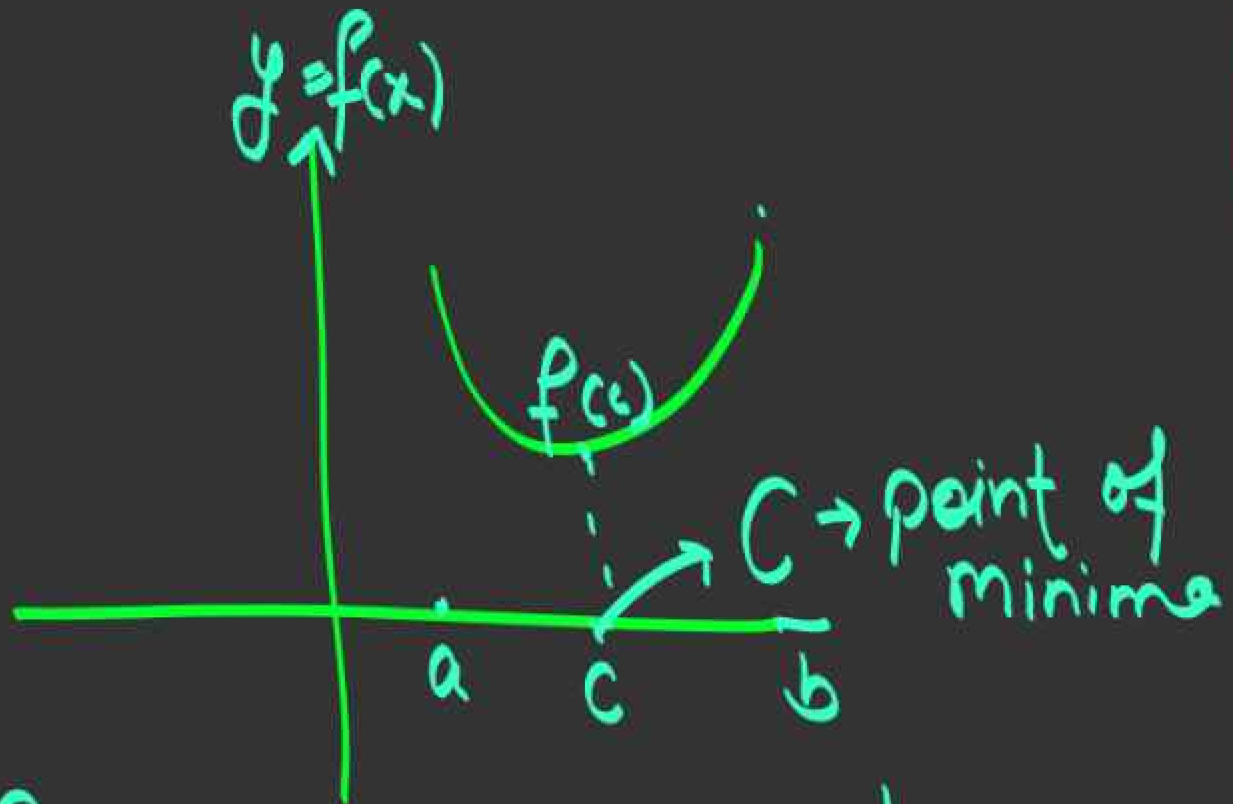
$$\boxed{y - y_1 = m(x - x_1)}$$

अभिलम्ब रेखा समी.

Equation of Normal ⇒

$$\boxed{y - y_1 = -\frac{1}{m}(x - x_1)}$$

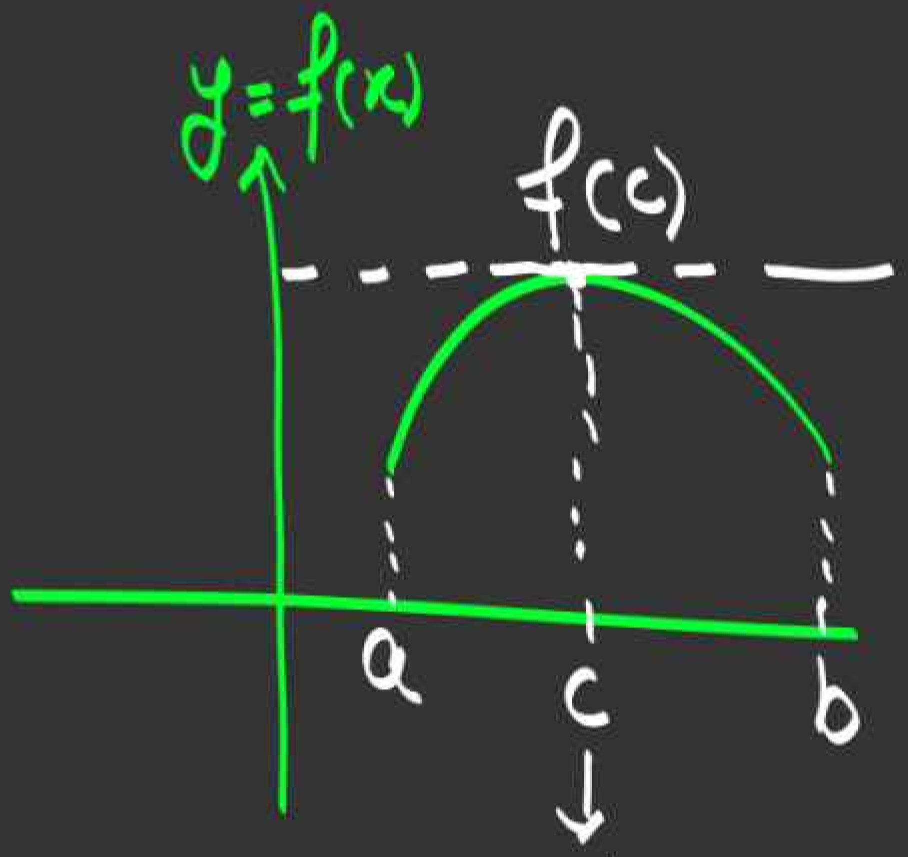
Maxima & Minima →



$f(c) \to$ minimum value

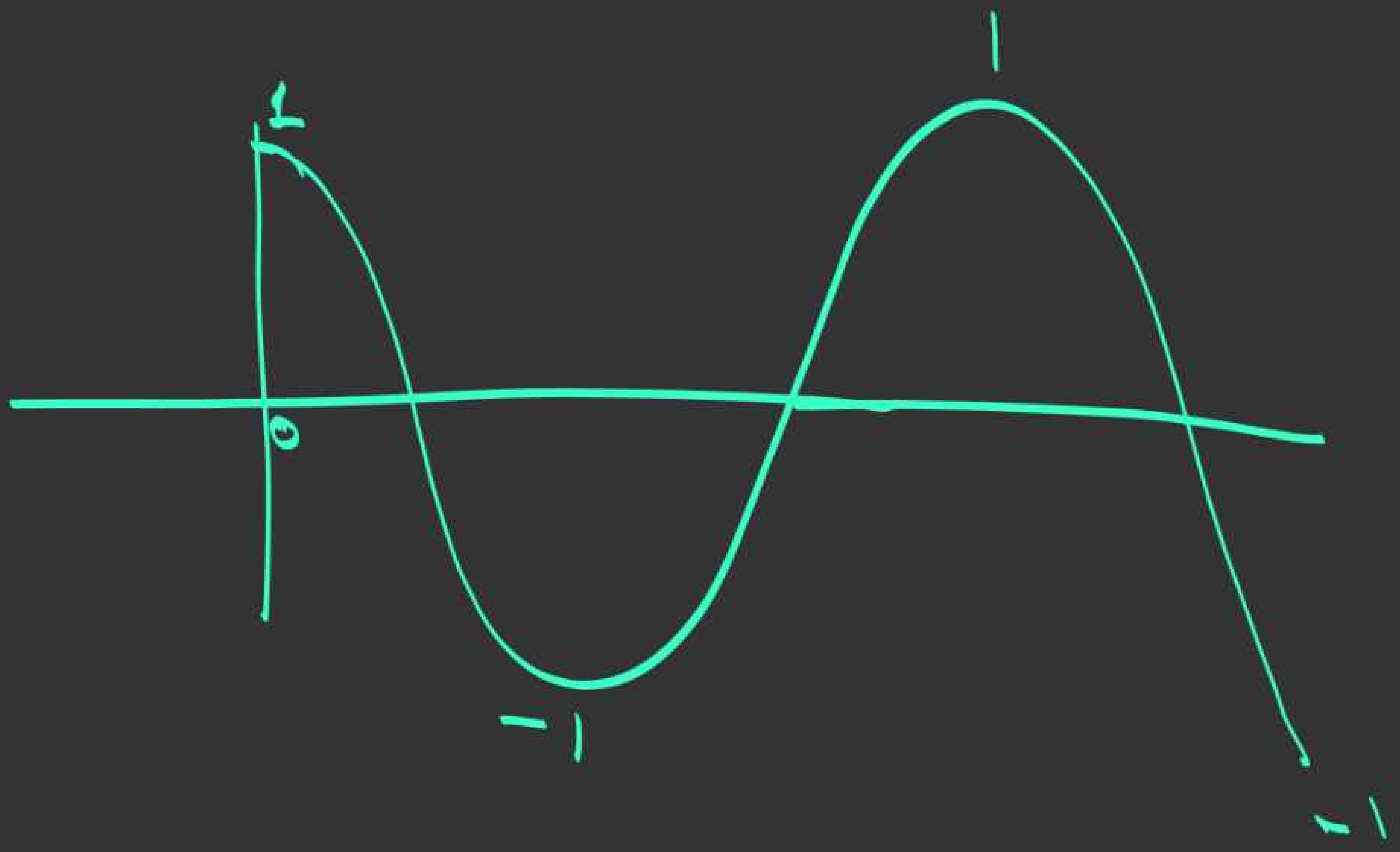
$f(c) < f(x) \; \forall \, x \in (a,b)$

$f(c) \Rightarrow$ maximum value



point C → point of maxima

If, $f(c) > f(x) \; \forall \, x \in (a,b)$


1
0
1
-1
-1

Concept of Local minima & Local Maxima →

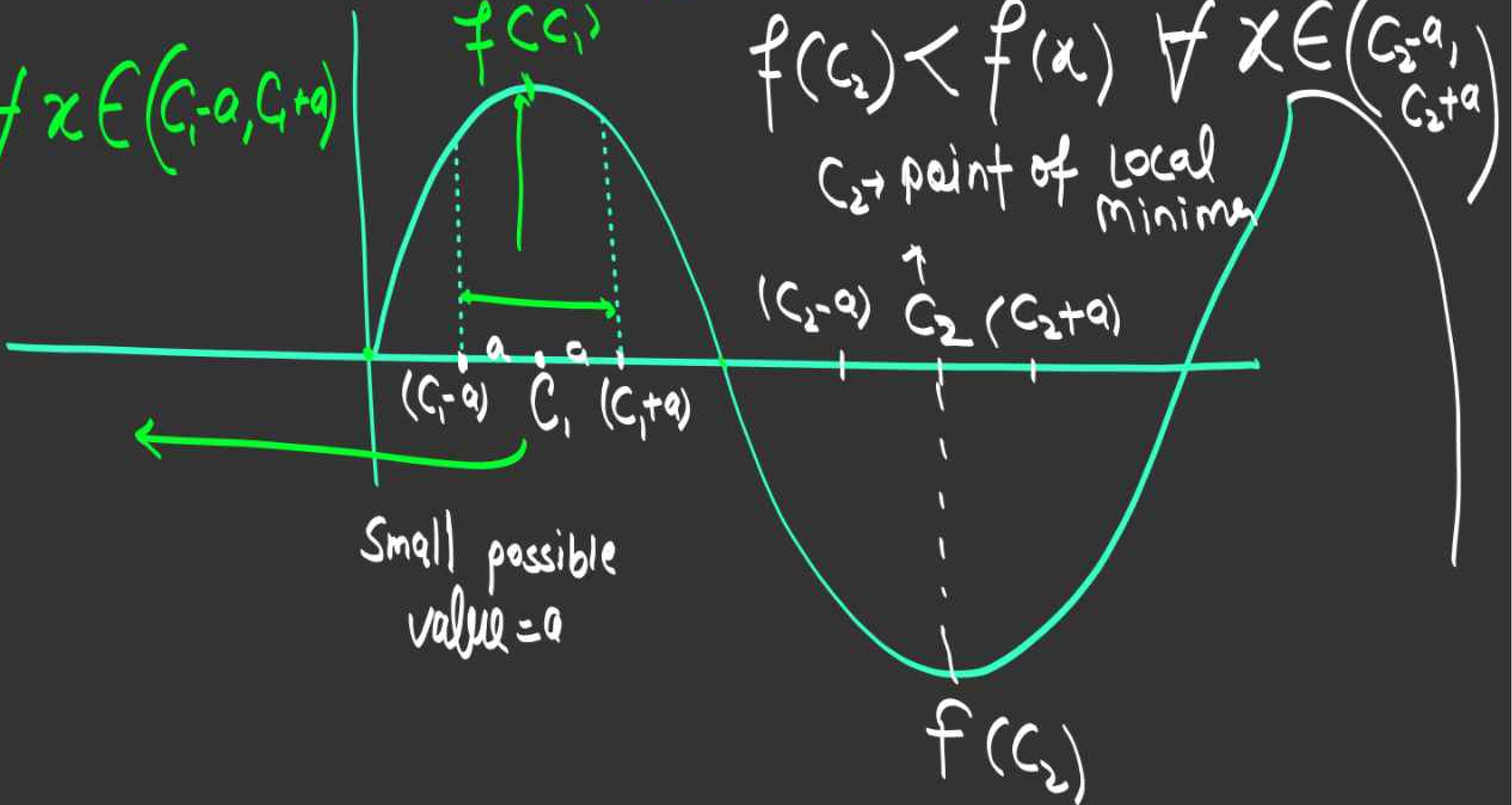
$f(c_1) \to$ Maximum value

$f(c_1) > f(x) \ \forall \ x \in (c_1 - a, c_1 + a)$

$f(c_2) < f(x) \ \forall \ x \in (c_2 - a, c_2 + a)$

$c_2 \to$ point of Local minima

c_1 is called point of Local Maxima



$f(x) =$

First derivative Test (To find Local Maxima & Local minima) →

STEP-1 → $f'(x) = 0$ ✓

STEP-2 → Allocate Extreme points / Critical points

STEP-3 → After allocating Extreme point on number Line, interval से $f'(x)$ का sign चेक करेंगे।

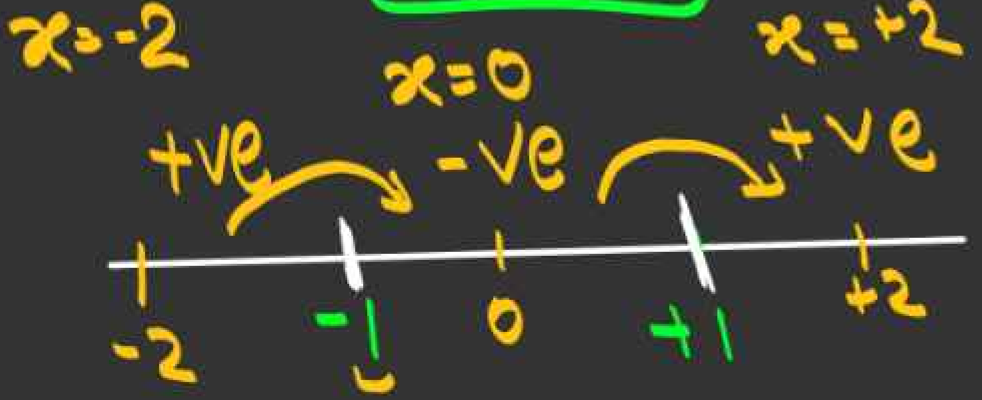
$f(x) = x^3 - 3x + 3$

$f'(x) = 3x^2 - 3 = 0$

$3x^2 = 3$

$x^2 = \frac{3}{3} = 1$

$\boxed{x = \pm 1}$ ✓



\# Extreme points पर ही Local Maxima या Local Minima मिलता है।

STEP-4 → Identification STep →

+ve –ve +ve

–1 +1

Left to Right जाने पर यदि $f'(x)$ का sign positive से negative हो जाए तो वह Extreme point, point of maxima होगा।

$x = -1$ point of maxima

$$f(x) = x^3 - 3x + 3$$
$$f(-1) = -1 + 3 + 3$$
$$\Rightarrow 5$$

Left to Right जाने यदि $f'(x)$ का sign negative से positive हो जाए वह Extreme point point of minima होगा।

$x = +1$ रखने पे

$$f(x) = x^3 - 3x + 3$$
$$f(1) = 1 - \cancel{3} + \cancel{3}$$
$$\Rightarrow 1$$

Slope of Tangent $(m) \Rightarrow \frac{dy}{dx} = f'(x)$