1) DERIVATIVES OF FUNCTIONS IN PARAMETRIC FORMS

- A relation expressed between two variables x and y in the form $x = f(t)$, $y = g(t)$ is said to be parametric form with t as a parameter.
- To find the derivative of these functions we use chain rule.
- Using chain rule we can write $\frac{dy}{dt} = \frac{dy}{dx} \times \frac{dx}{dt}$
- Hence $\frac{dy}{dx} = \frac{\left(\frac{dy}{dt}\right)}{\left(\frac{dx}{dt}\right)}$, whenever $\frac{dx}{dt} \neq 0$

2) DIFFERENTIATION OF A FUNCTION W.R.TO ANOTHER FUNCTION

Let u = f(x) and v = g(x) be two functions of x , then to find the derivative of f(x) w.r.to g(x) i.e. to find the derivative of u w.r.to v we use the formula

$$\frac{du}{dv} = \frac{\left(\frac{du}{dx}\right)}{\left(\frac{dv}{dx}\right)}$$

3) SECOND ORDER DERIVATIVE

- Let y = f(x) be a given function. Then we can find the derivative of y w.r.to x. i.e $\frac{dy}{dx} = f'(x)$ -------(1)
- If f'(x) is again differentiable then we can differentiate equation (1) w.r.to x again then the left hand side becomes $\frac{d}{dx}\left(\frac{dy}{dx}\right)$ this is called the second derivative of y w.r.to x and we write this as $\frac{d}{dx}\left(\frac{dy}{dx}\right) = \frac{d^2y}{dx^2}$. The second order derivative of f(x) is also denoted by $f''(x)$. It is also denoted by y'' or y_2

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