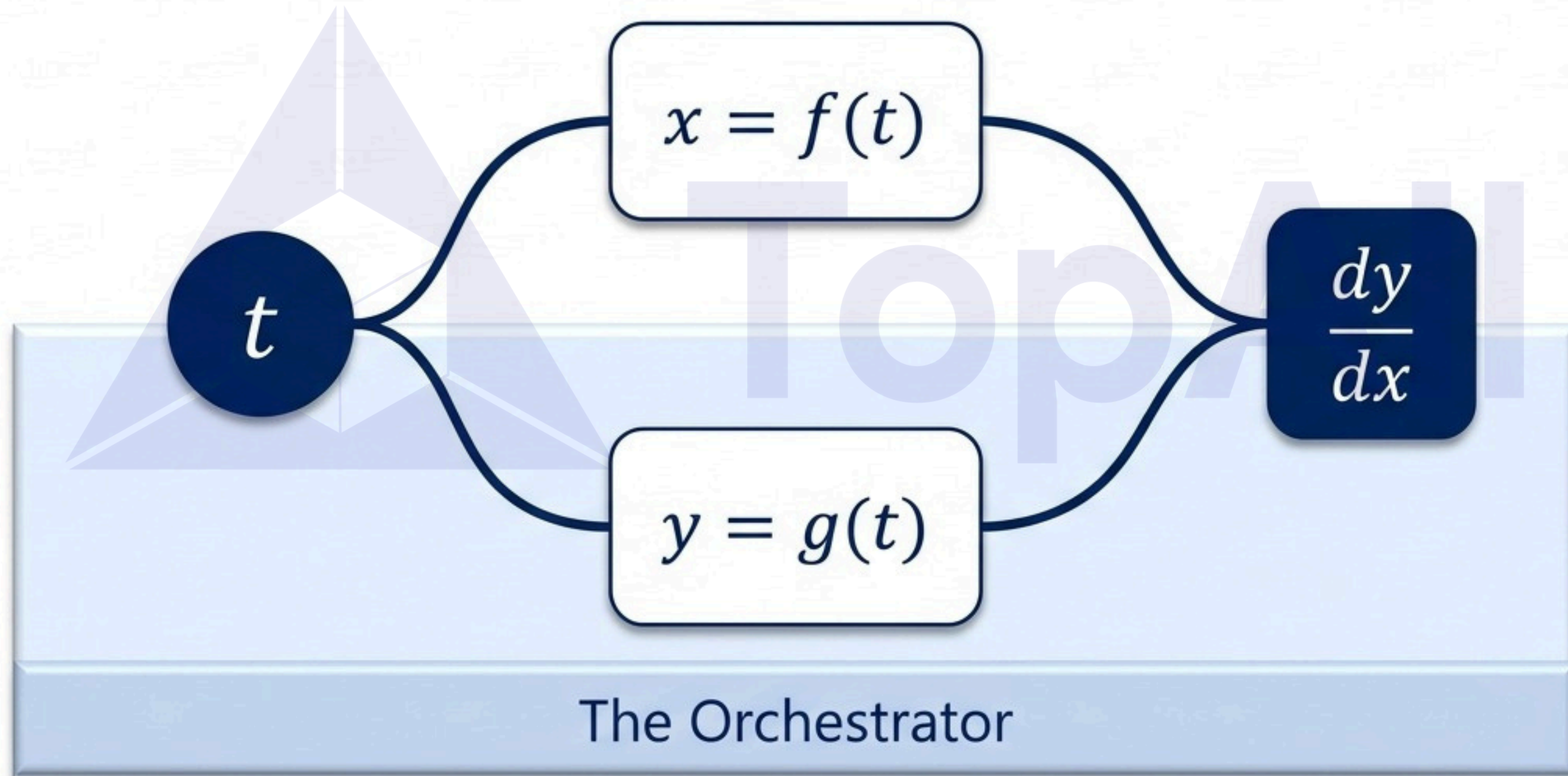


Parametric Differentiation

When x and y both depend on another variable

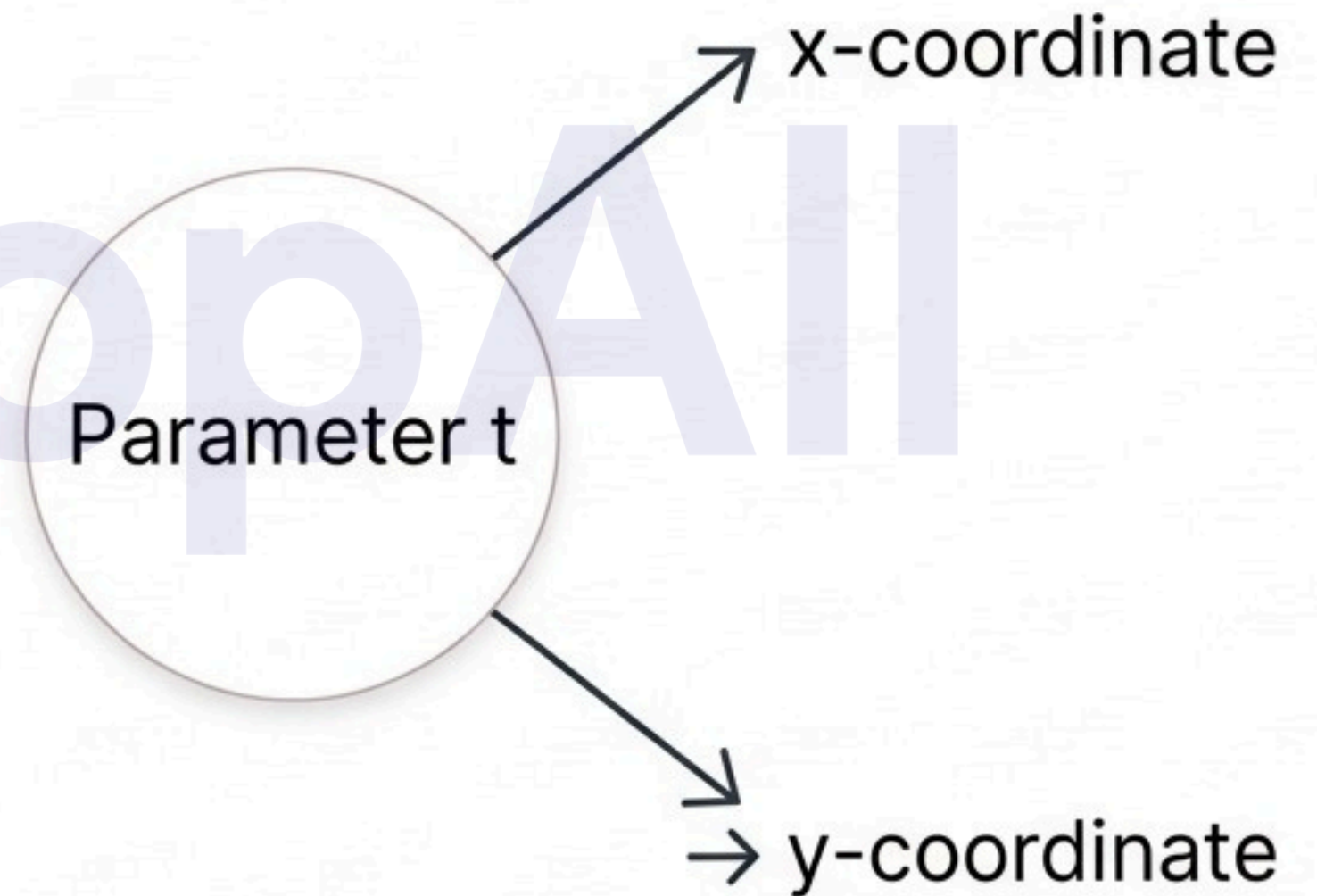


The Third Variable Controls Both Coordinates

The relation between x and y is expressed through t .

$$x = f(t)$$

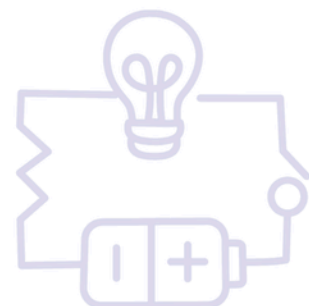
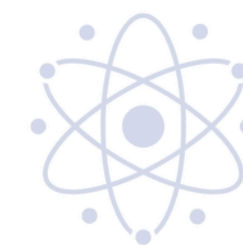
$$y = g(t)$$





**You've Learned the Theory.
Let's Test Them Now.**

$$E=mc^2$$



Turn theory into marks with **unlimited MCQs, smart analysis, and focused revision.**

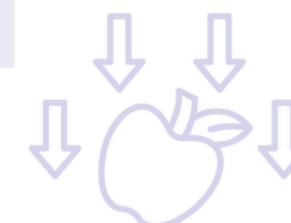
Practice Now



At prep.topall.app

Key Highlights

- » Free Study Material, Videos & Infographics
- » Push Your Limits with Level-Based Challenges
- » Climb the Leaderboard Among Fellow Aspirants
- » Practice Unlimited MCQs for NEET & JEE
- » Get Clear Explanations, Not Just Marks
- » Track Your Performance Smarter



Use the Chain Rule

$$\frac{dy}{dt} = \frac{dy}{dx} \cdot \frac{dx}{dt}$$



$$\frac{dy}{dx} = \frac{\frac{dy}{dt}}{\frac{dx}{dt}}$$



Provided $\frac{dx}{dt} \neq 0$

Three Simple Steps

1

Differentiate x

Find $\frac{dx}{dt}$

2

Differentiate y

Find $\frac{dy}{dt}$

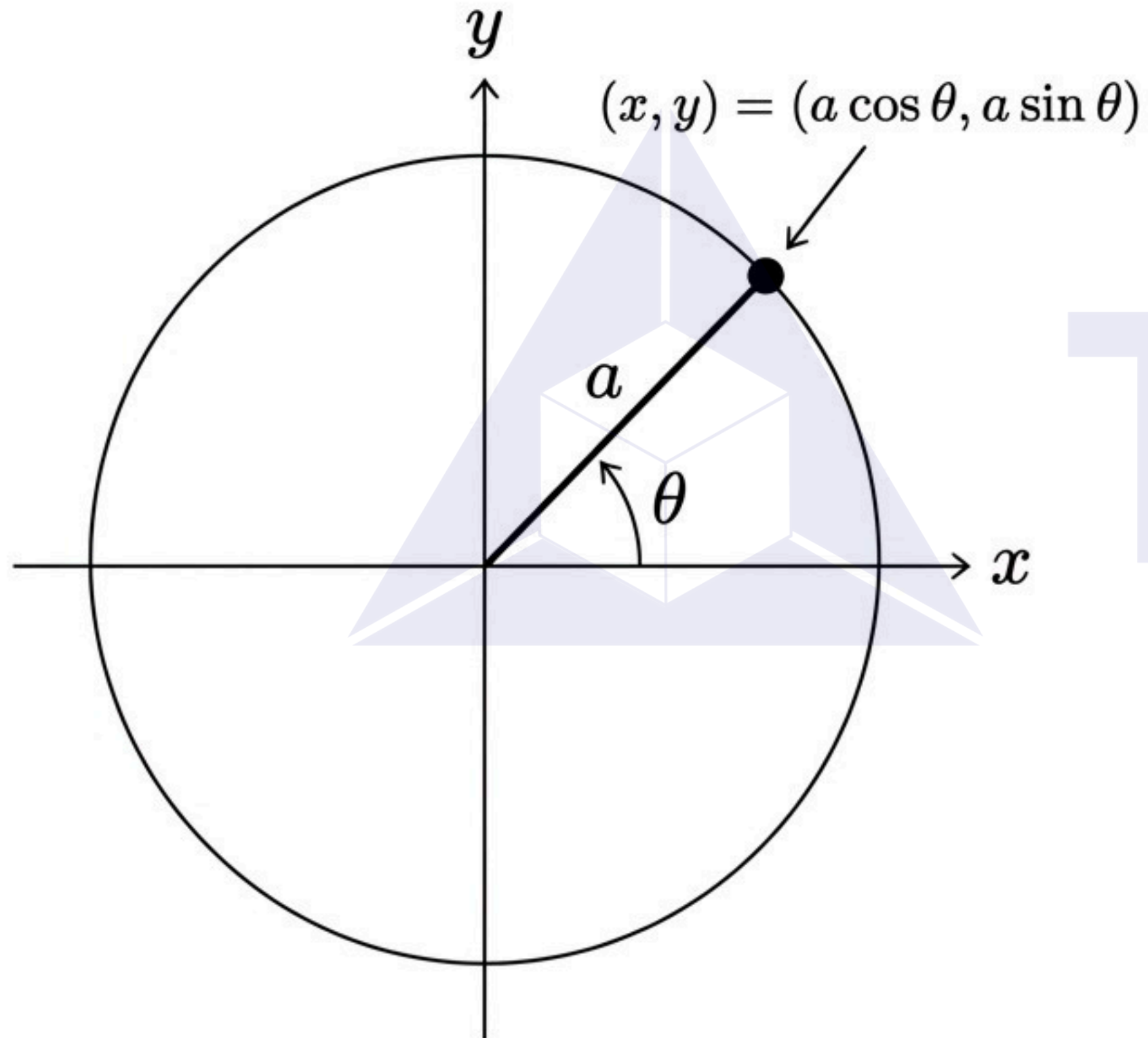
3

Divide

$$\frac{dy}{dx} = \frac{\frac{dy}{dt}}{\frac{dx}{dt}}$$

Y rate / X rate

Example: $x = a \cos \theta, y = a \sin \theta$



$$\frac{dx}{d\theta} = -a \sin \theta$$

$$\frac{dy}{d\theta} = a \cos \theta$$

Therefore:

$$\frac{dy}{dx} = \frac{a \cos \theta}{-a \sin \theta}$$

$$= -\cot \theta$$

Parametric Derivative in One Frame



$$\frac{dy}{dx} = \frac{g'(t)}{f'(t)}$$

provided $f'(t) \neq 0$

$$\frac{dy/dt}{dx/dt}$$

The final derivative may remain in terms of the parameter (t or θ).

Do not reverse the fraction.

A large red 'X' is drawn over the incorrect derivative formula $\frac{dx/dt}{dy/dt}$, which is written in red. The 'X' is composed of two thick red lines crossing each other.



You've Learned the Theory.

Now Let's Test It.

Reading notes gets you knowledge.

Practicing MCQs gets you marks.

That's exactly what TopAll Pro is built for.

Try TopAll Pro Now

What TopAll Pro Does Differently

-  **Stuck? Snap it. Solve it. — Doubts AI**
Photo → step-by-step solution in seconds, 24/7
-  **Your AI Coach finds your blind spots**
Concept-level weakness detection — not just chapter-level
-  **4.5 Lakh+ questions. Never run out.**
13× more content than any other prep app in India
-  **Build your own test in 60 seconds**
Pick a chapter, set difficulty — AI does the rest instantly.
-  **AI Recommendation that helps you improve**
AI Recommendation Analysis your Tests and tell you where you need to improve.



Practice the moment you finish studying
Jump in while the concept is still fresh in your head

4.5L+
MCQs

1.5L+
Students

AI Powered
In-Depth Analysis