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ARJUN BATCH

CLASS 11th | PHYSICS

समतल में गति

MOTION IN A PLANE

Chapter-3 | Part-3



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आज क्या पढेंगे ?



1 सदिश संयोजन के नियम

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सदिश संयोजन के नियम

त्रिभुज का नियम

बहुभुज



समान्तर-चतुर्भुज का नियम :-

आयत → 90°

समान्तर-चतुर्भुज

आसन्न = समीप (पास-पास)

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समान्तर चतुर्भुज का नियम :- यदि समान्तर-चतुर्भुज की दो आसन्न भुजाओं को सदिश में व्यक्त किया जाये तो तो इनके कटान बिन्दु से निकलने वाला विकर्ण इनके परिणामी सदिश के बराबर होता है।

mg

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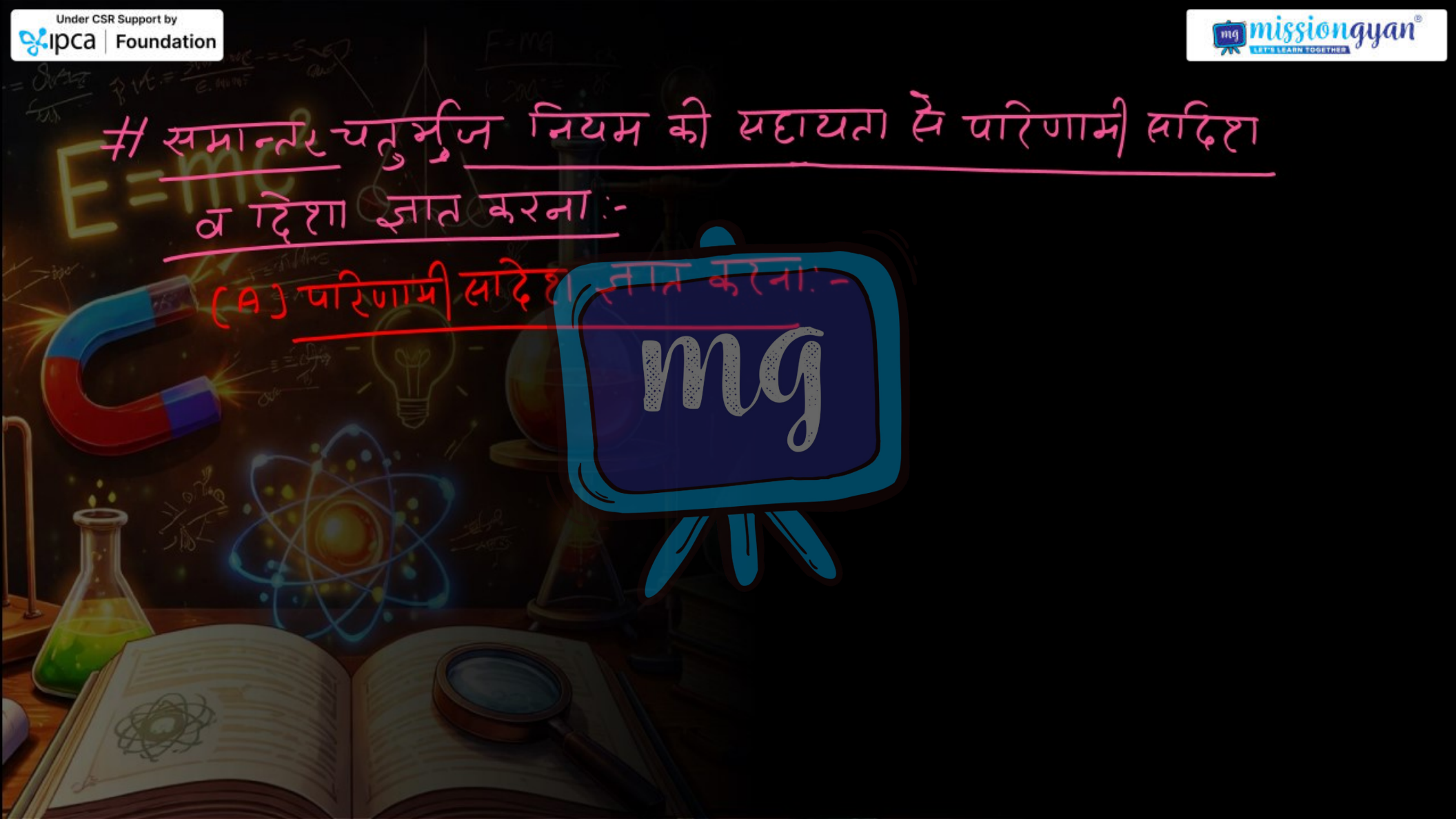
समान्तर चतुर्भुज नियम की सहायता से परिणामी सदिश व दिशा ज्ञात करना :-

(A) परिणामी सदिश ज्ञात करना :-



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समकोण $\triangle AEC$ में,
पाइथागोरस प्रमेय से,

$(\text{कर्ण})^2 = (\text{आ.})^2 + (\text{लं.})^2$

$(AC)^2 = (AE)^2 + (CE)^2$

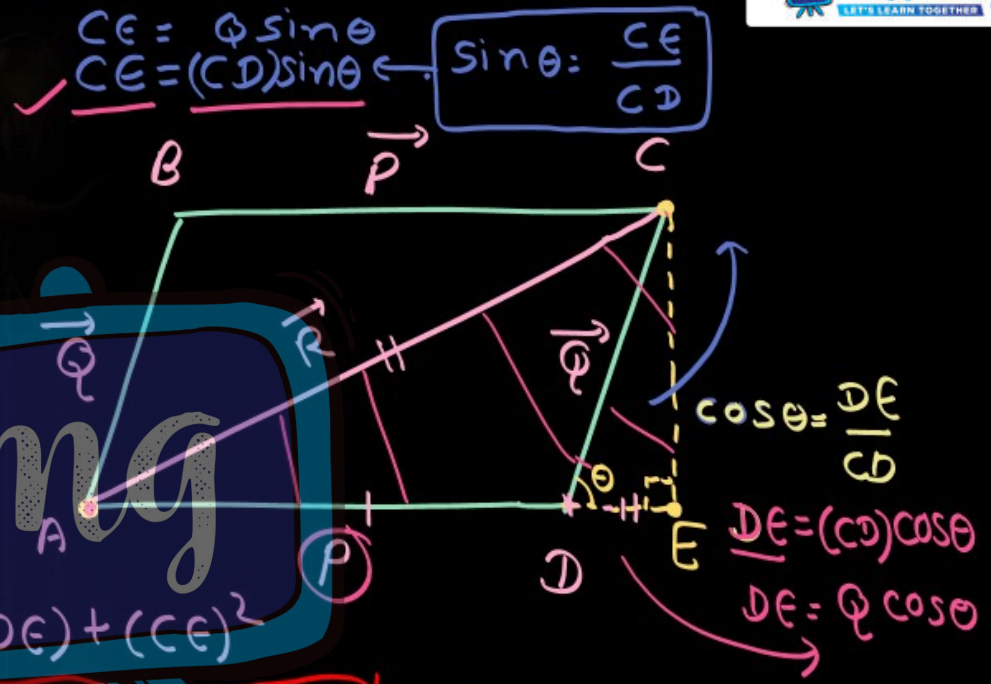
$(AC)^2 = (AD + DE)^2 + (CE)^2$

$(x+y)^2 = x^2 + y^2 + 2xy$

$(AC)^2 = (AD)^2 + (DE)^2 + 2(AD)(DE) + (CE)^2$

$(R)^2 = (P^2) + (Q\cos\theta)^2 + 2(P)(Q\cos\theta) + (Q\sin\theta)^2$

$R^2 = P^2 + Q^2(\cos^2\theta + \sin^2\theta) + 2PQ\cos\theta$



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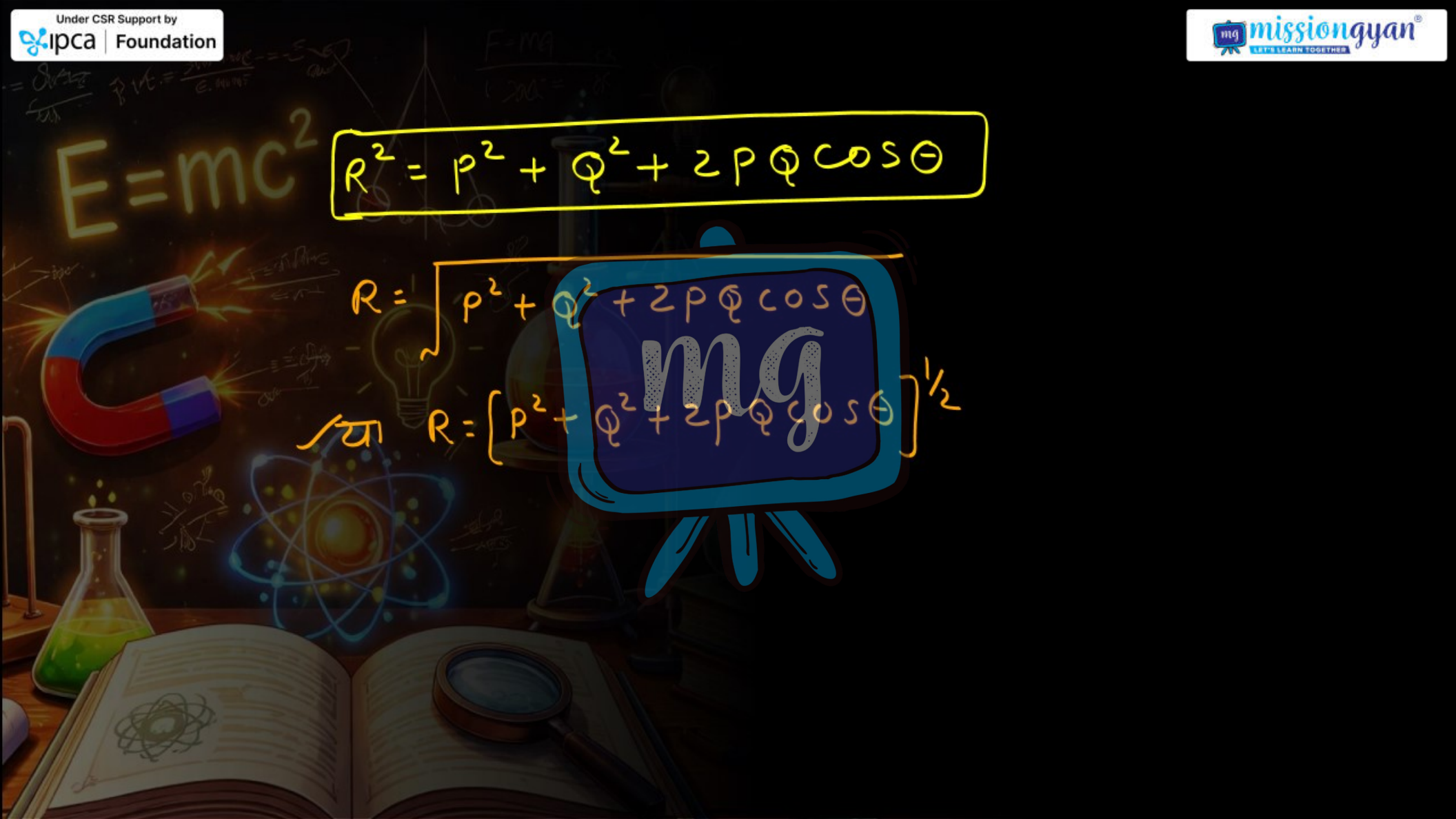

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$E = mc^2$

(B) परिणामी दिशा ज्ञात करना :-

$$\tan\theta = \frac{CE}{AE}$$

$$\tan\theta = \frac{CE}{AD + DE}$$

$$\tan\theta = \frac{Q\sin\theta}{P + Q\cos\theta}$$

$$\theta = \tan^{-1}\left(\frac{Q\sin\theta}{P + Q\cos\theta}\right)$$

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→ दिशा ज्ञात की जाती है ($\tan\theta$)

slope

→ $\tan^{-1}$ $\tan^{-1}x$ → Inverse

प्रतिलोम



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विशेष स्थितियाँ :-

Ist जब दोनों एक ही दिशा में हैं :- $P \; a \; Q$

समान दिशा



दो बल समान दिशा में लग रहे हैं - $\theta = 0^\circ$

$$R^2 = P^2 + Q^2 + 2PQ\cos\theta$$

$$\boxed{R^2 = P^2 + Q^2 + 2PQ}$$

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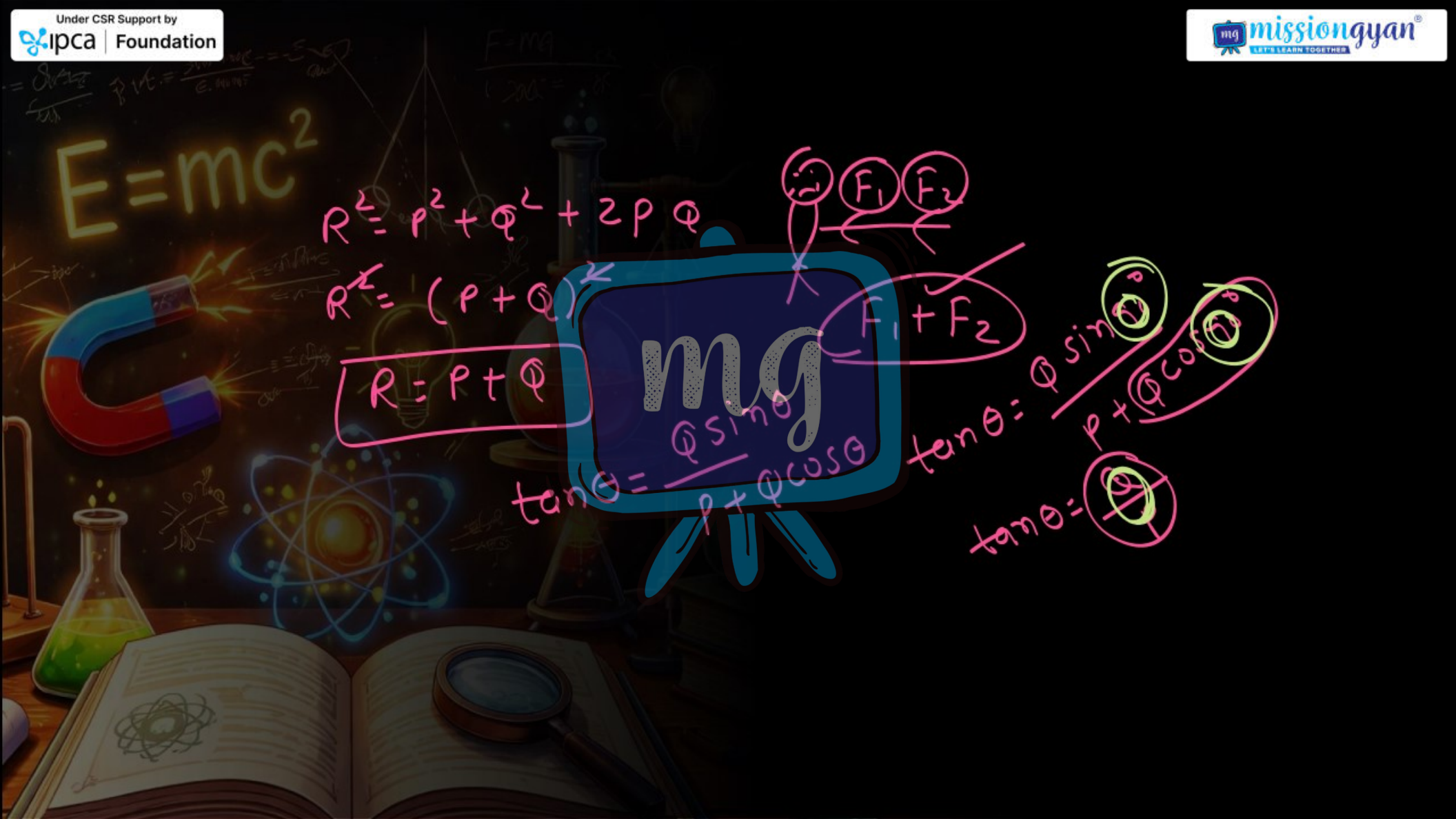

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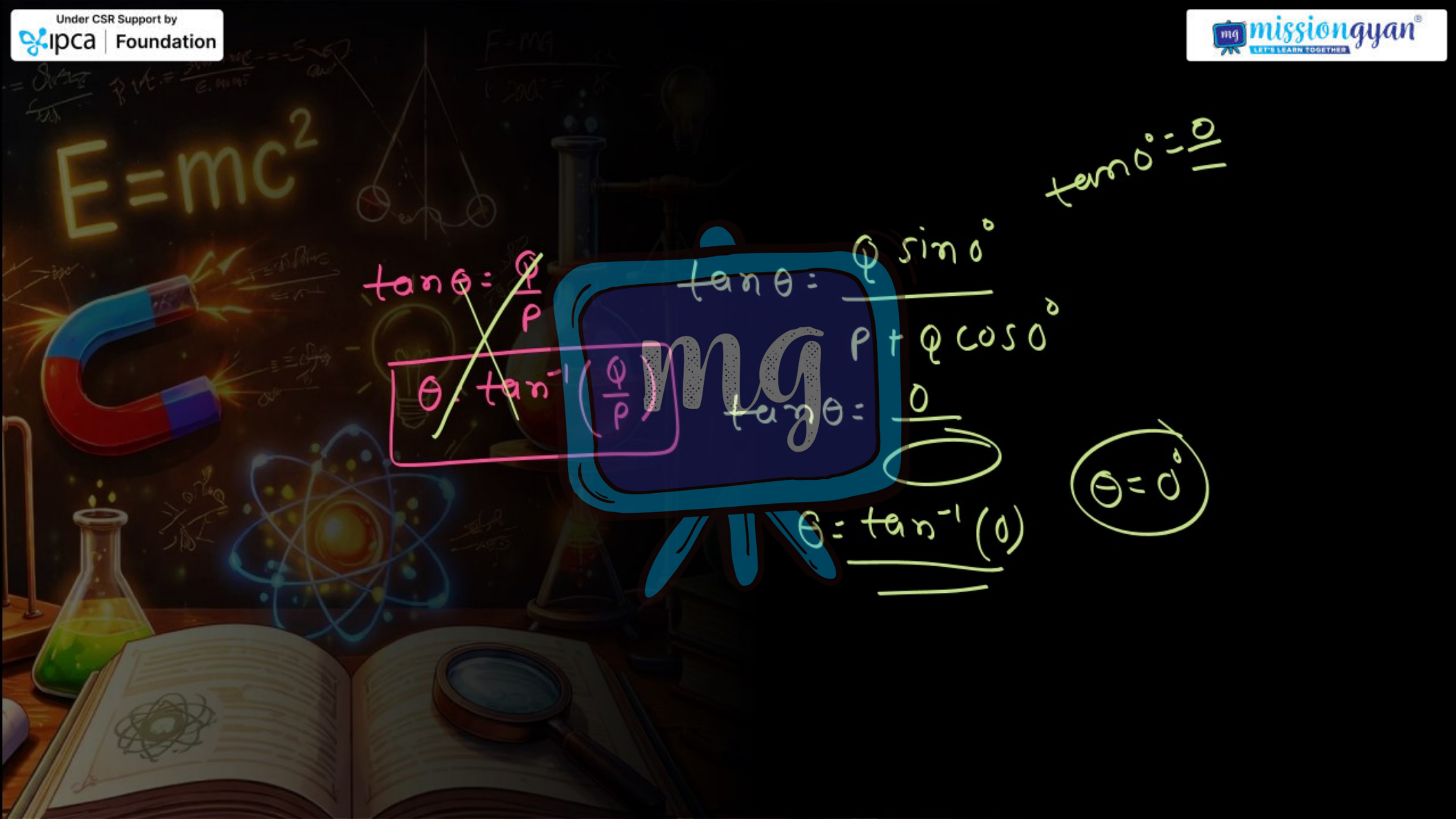

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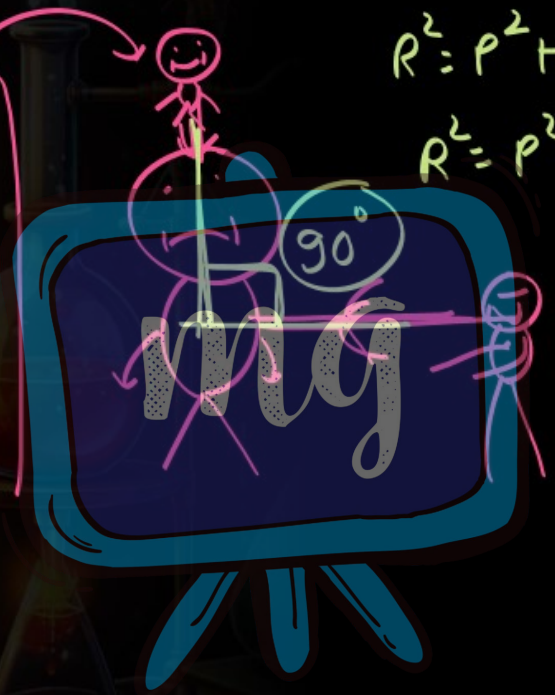
$E=mc^2$

2nd case:



$R^2 = P^2 + Q^2 + 2PQ\cos 90^\circ$

$R^2 = P^2 + Q^2 + 0$

$R^2 = (P^2 + Q^2)$

$R = \sqrt{P^2 + Q^2}$

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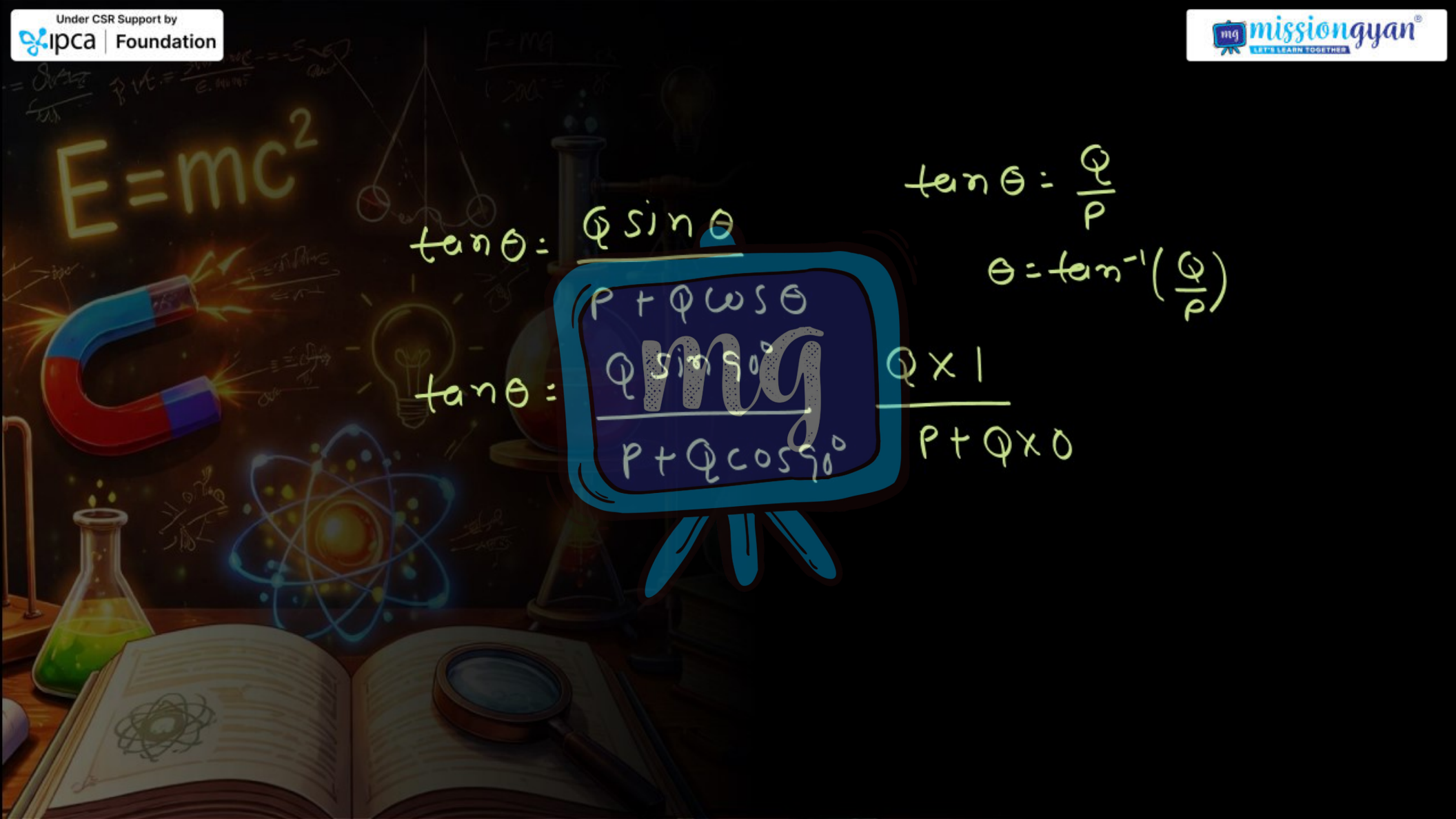

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$E=mc^2$

III rd जब दोनों परस्पर विपरित हैं—

$\theta = 180^\circ$ (π)



$R^2 = P^2 + Q^2 + 2PQ\cos\pi$

$\cos\pi = -1$

$R^2 = P^2 + Q^2 - 2PQ$

$R^2 = (P-Q)^2$

$R = P - Q$

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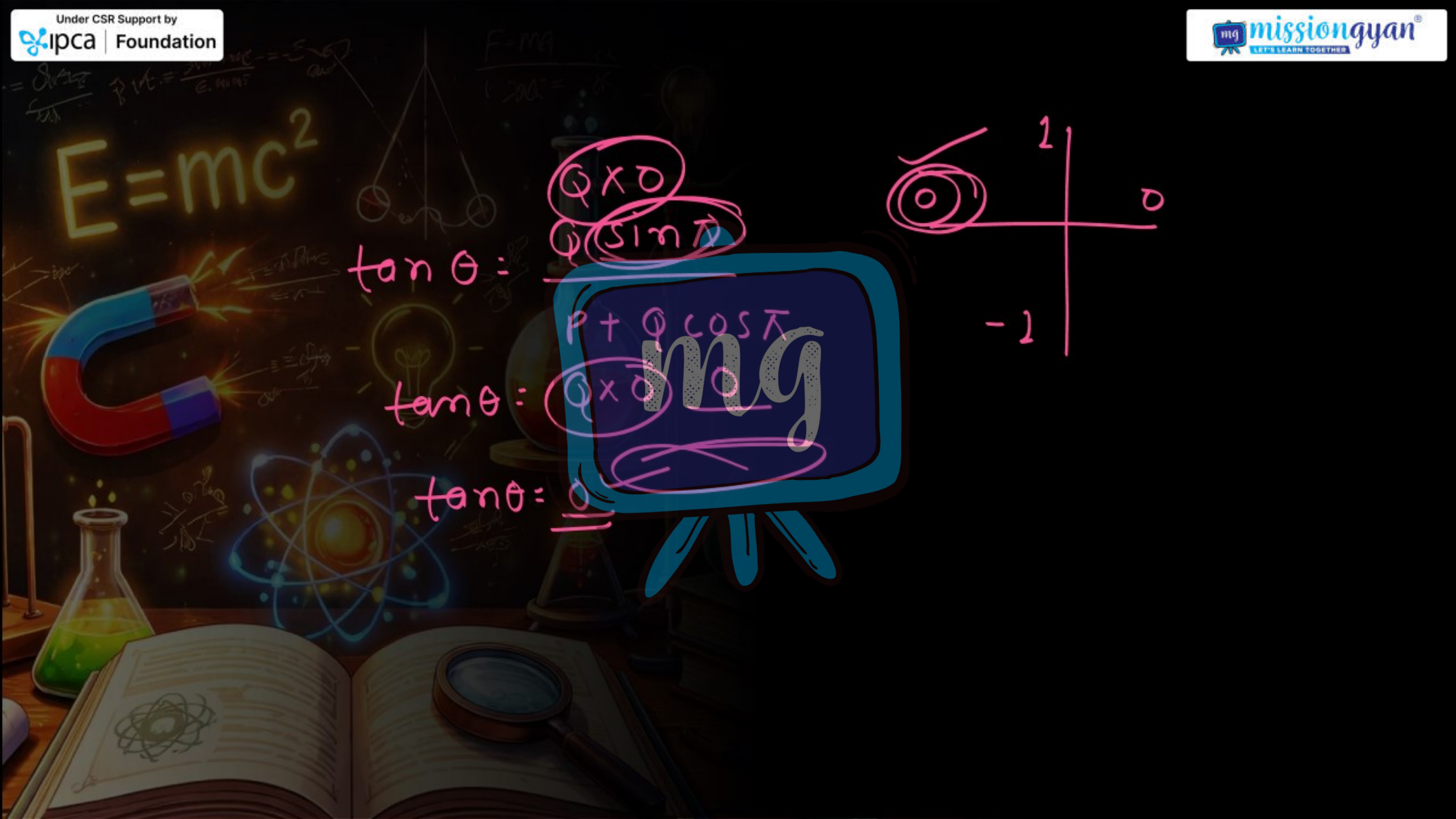

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