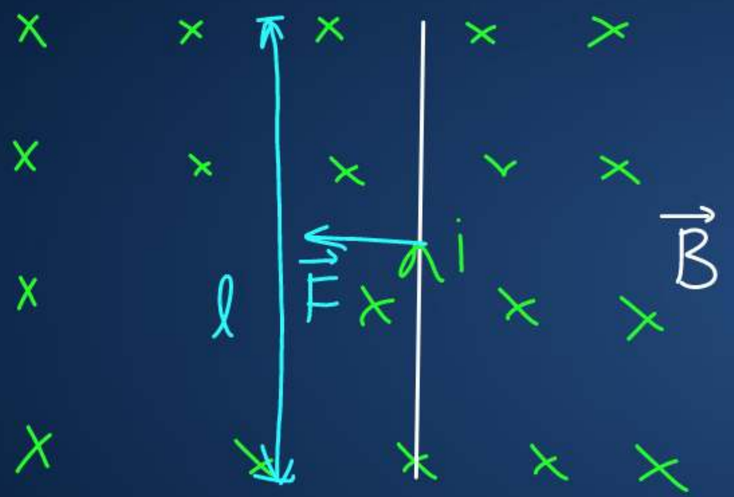

समस्त बिहार, भरेगा हुंकार
HUNKAR
2025
में आपका स्वागत हैं

FORCE ON A CURRENT CARRYING WIRE IN MAGNETIC FIELD

धारावाही चालक तार पर चुम्बकीय क्षेत्र में लगने वाला बल



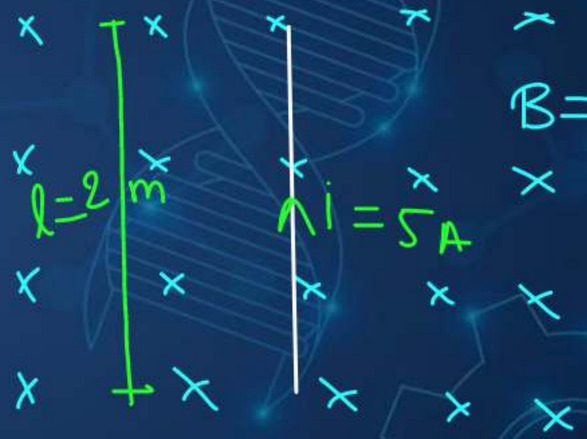
$F \propto i$

$F \propto l$

$F \propto B$

$$F = ilB$$

Example.



$F = 100\,N$

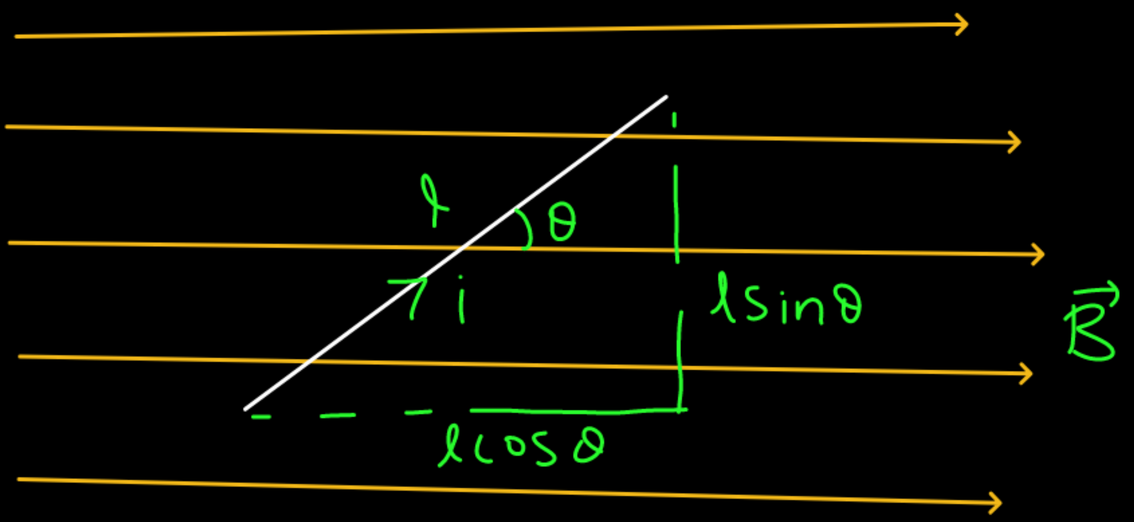
$\because F = qVB$

$F = q\frac{l}{t}B$

$F = \frac{q}{t} \cdot lB$ $\quad F = ilB$

⊛ When wire is at some angle with magnetic field.

यदि चुम्बकीय क्षेत्र में तार किसी कोण पर रखा है।



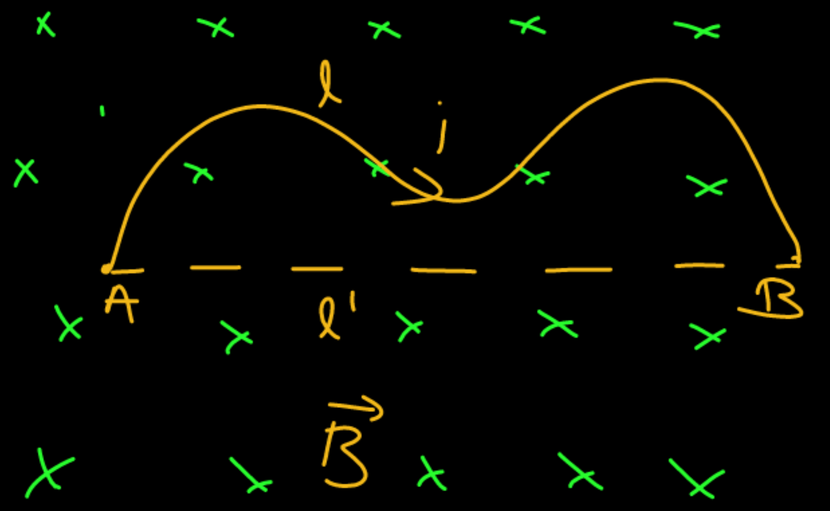
$$F = i(l\sin\theta)\cdot B$$

$$\boxed{F = ilB\sin\theta}$$

$$\boxed{\vec{F} = i(\vec{l}\times\vec{B})}$$

⊛ Concept.

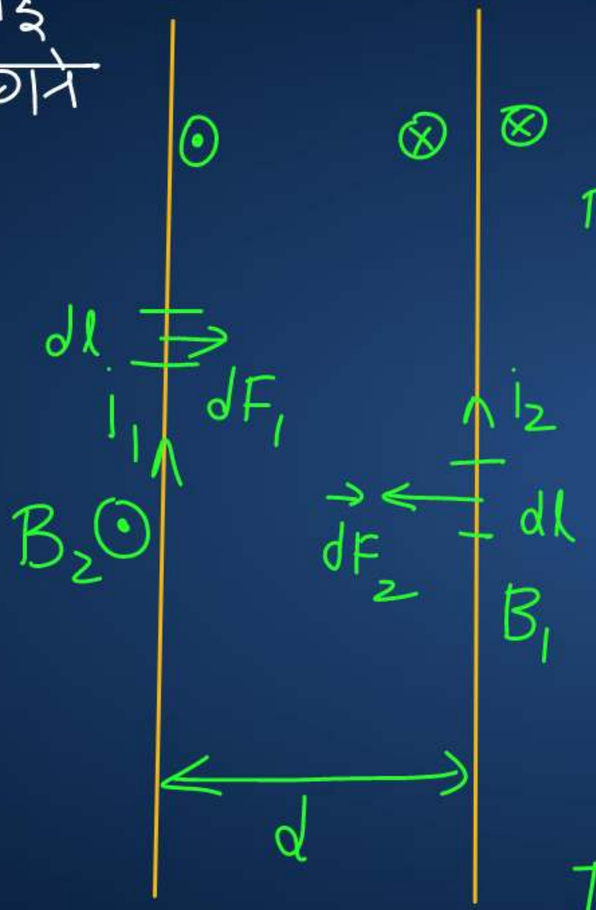
$$\vec{F} = q(\vec{V}\times\vec{B})$$



$$\boxed{F = il'B}$$

FORCE PER UNIT LENGTH BETWEEN TWO PARELLEL WIRES

दो समानान्तर धारावाही तार के बीच इकाई लंबाई पर लगने वाला बल



$dF_2 = i_2\, dl\, B_1$

Magnetic field at i_2 due to i_1

i_2 पर आरोपित चुम्बकीय क्षेत्र i_1 के कारण

$$B_1 = \frac{\mu_0 i_1}{2\pi d}$$

$$dF_2 = i_2 \cdot dl \cdot \frac{\mu_0 i_1}{2\pi d}$$

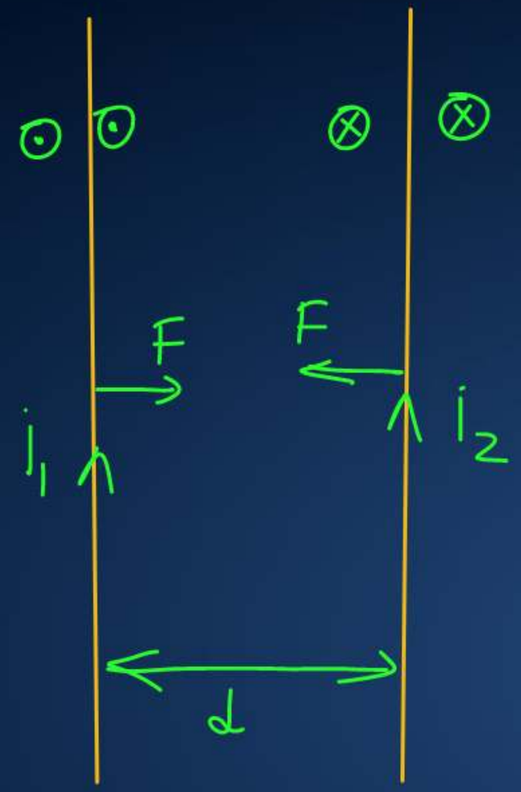
$$\boxed{\frac{dF_2}{dl} = \frac{\mu_0 i_1 i_2}{2\pi d}}$$

$$dF_1 = i_1\, dl \cdot B_2$$

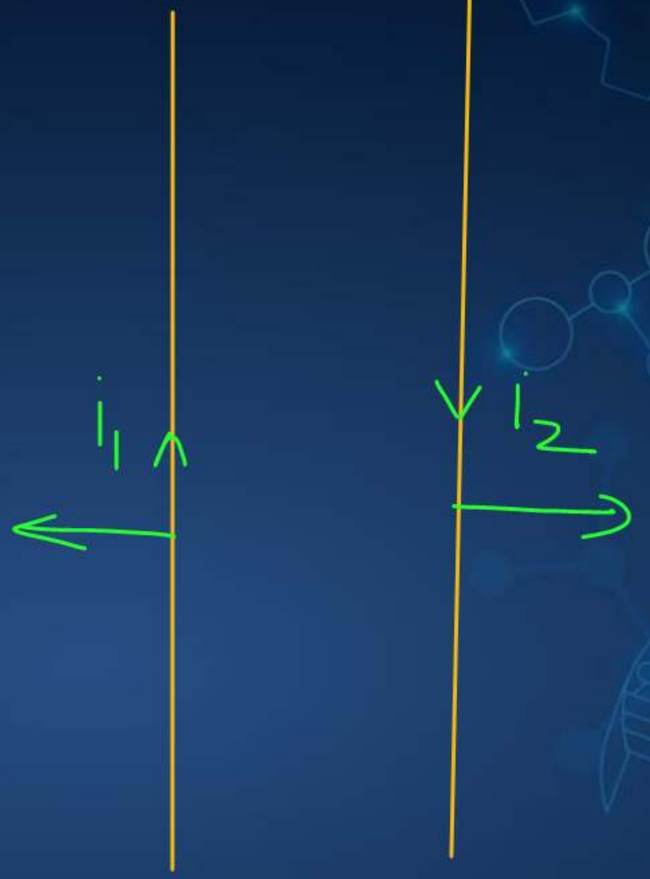
$$\therefore B_2 = \frac{\mu_0 i_2}{2\pi d}$$

$$dF_1 = i_1 dl \cdot \frac{\mu_0 i_2}{2\pi d}$$

$$\boxed{\frac{dF_1}{dl} = \frac{\mu_0 i_1 i_2}{2\pi d}}$$



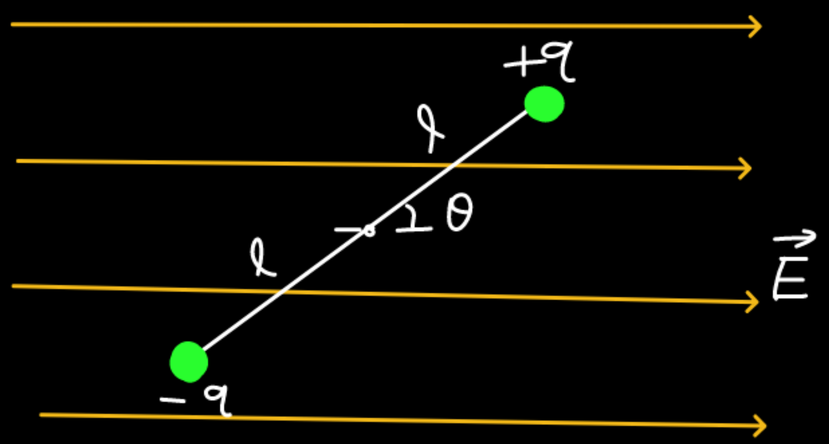
Attraction
आकर्षण



Repulsion
विकर्षण

Hw.

⊛ Torque on electric dipole.



Brain

⊛ Objective

Electric field & Gauss's law.