



$$\vec{L} = s \hat{i} + d \hat{j}$$

straight line connecting
a to b

For arbitrary wire :

$$d\vec{s} = dx \hat{i} + dy \hat{j}$$

$$\vec{F}_{\text{wire}} = \frac{\mu_0 I}{c} \int (dx \hat{i} + dy \hat{j}) \times \vec{B}$$

$$= \left(\frac{\mu_0 I}{c} \int dx \hat{i} + dy \hat{j} \right) \times \vec{B}$$

\vec{B} uniform

$$= \left(\frac{\mu_0 I}{c} s \hat{i} + y \hat{j} \right) \times \vec{B}$$

$$= \frac{\mu_0 I}{c} \vec{L} \times \vec{B}$$

force on straight wire
from A to B