GAUSS'S LAW FOR MAGNETIC FIELDS (DIFFERENTIAL FORM)

PROCEEDING SIMILARLY THAN WITH $\bar{E}$,

$$\boxed{\bar{\nabla} \cdot \bar{B} = 0}$$

GAUSS'S LAW FOR MAGNETIC FIELDS (DIFFERENTIAL)

THE DIVERGENCE OF THE $\bar{B}$ FIELD AT ANY POINT IS ZERO.

EXAMPLE:

A VECTOR FIELD IS GIVEN BY:

$$\bar{A}(x,y) = \cos(x)\,\hat{i} + y.\sin(x)\,\hat{j}$$

COULD THIS BE A MAGNETIC FIELD?

SOLUTION: TO BE A MAGNETIC FIELD, $\nabla \cdot \bar{A} = 0$.

$$\nabla \cdot \bar{A} = \frac{\partial}{\partial x}\cos(x) + \frac{\partial}{\partial y}y.\sin(x)$$

$$\nabla \cdot \bar{A} = \sin(x) - \sin(x) = 0$$

SINCE $\nabla \cdot \bar{A} = 0$, $\bar{A}$ COULD REPRESENT A $\bar{B}$ FIELD.