Ampere's Circuital Law:

Ampere's circuital law states that the line integral of the magnetic field $\vec{H}$ (circulation of H) around a closed path is the net current enclosed by this path. Mathematically,

$$\oint \vec{H}.\vec{dl} = I_{enc}$$

The total current I_{enc} can be written as,

$$I_{enc} = \int_S \vec{J}.\vec{ds}$$

By applying Stoke's theorem, we can write

$$\oint \vec{H}\,\vec{dl} = \int_S \nabla \times \vec{H}\,\vec{ds}$$

$$\therefore \int_S \nabla \times \vec{H}.\vec{ds} = \int_S \vec{J}\,\vec{ds}$$

$$\therefore \nabla \times \vec{H} = \vec{J}$$

which is the Ampere's law in the point form.