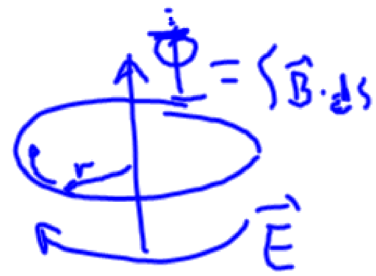
$$\vec{\nabla} \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}$$



$$\oint \vec{E} \cdot d\vec{l} = -\frac{\partial}{\partial t} \int \vec{B} \cdot d\vec{s}$$

$$= -\int \frac{\partial \vec{B}}{\partial t} \cdot d\vec{s}$$

$$2 \pi r E = -\dot{\Phi}$$

$$\vec{F}_r = \left(\frac{d\vec{p}}{dt}\right)_r \Rightarrow \quad \omega p = q v B = \omega r q B$$

$$= (q \vec{v} \times \vec{B})_r + q \vec{E}_r \qquad \frac{1}{r} = qB/p$$

Constant radius $\Rightarrow \dot{r} = 0$ d/dt

$$-\frac{1}{r^2}\dot{r} = 0 = q\left(\frac{\dot{B}}{p} - \frac{B}{p^2}\dot{p}\right) = \frac{q}{p}\left(\dot{B} - \frac{B}{p}\dot{p}\right)$$

$$\dot{p} = qE$$
$$= q\dot{\Phi}/2\pi r$$

$$= \frac{q}{p}\left(\dot{B} - \frac{1}{rq}\frac{q\dot{\Phi}}{2\pi r}\right)$$

$$0 = \frac{q}{p}\left(\dot{B} - \frac{\dot{\Phi}}{2\pi r^2}\right)$$

$$\dot{\Phi} = 2\pi r^2 \dot{B} = 2\dot{B} \times \text{Area}$$