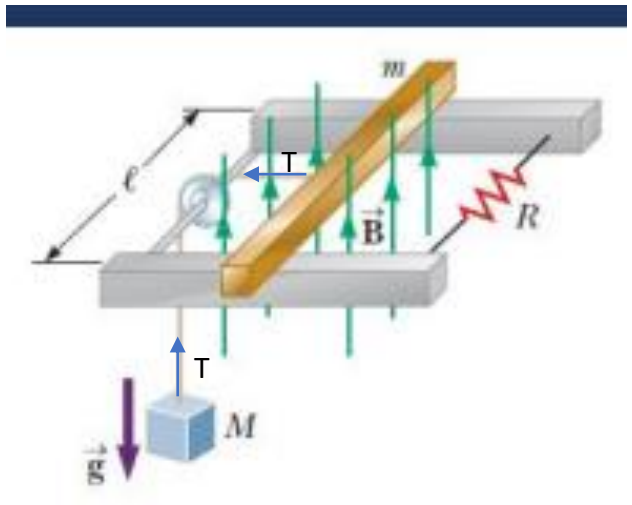
Análisis de fuerzas:



$$I_{ind} lB - M(a+g) = -m * a$$

$$\frac{Bl\Delta d}{R\Delta t} lB - M(a+g) = -m * a$$

$$\frac{B^2 l^2 v}{R} - M(a+g) = -m * a$$

$$-(M+m)a - \frac{B^2 l^2 v}{R} = -Mg$$

$$-a - \frac{B^2 l^2 v}{(M+m)R} = -\frac{Mg}{(M+m)}$$

$$-\frac{dv}{dt} - \frac{B^2 l^2}{(M+m)R} v = -\frac{Mg}{(M+m)}$$

$$v(t) = \frac{gMR(1 - e^{-(B^2 l^2 t)/R(M+m)})}{B^2 l^2}$$