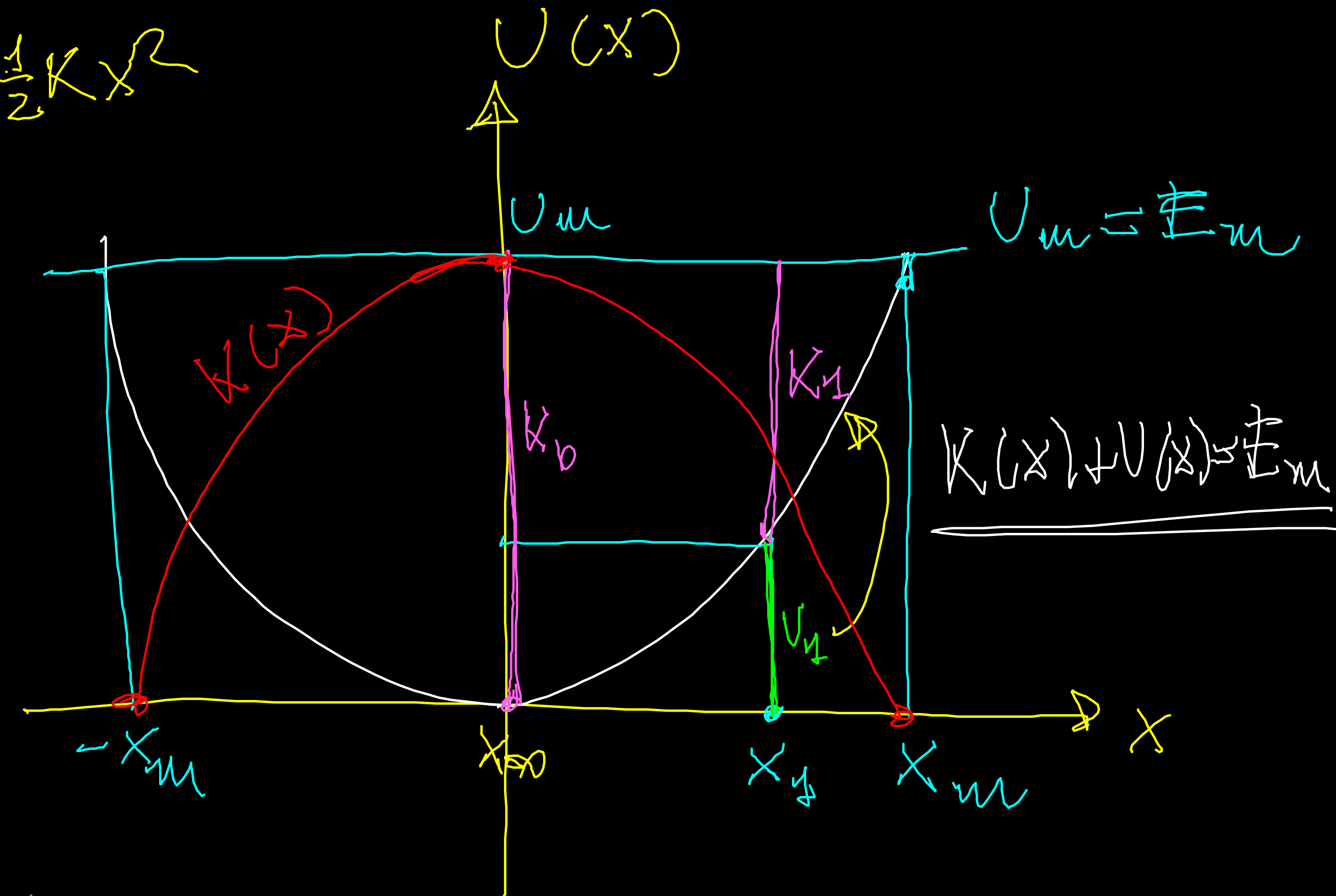


$$U = \frac{1}{2} k x^2$$



$$E = U + K$$

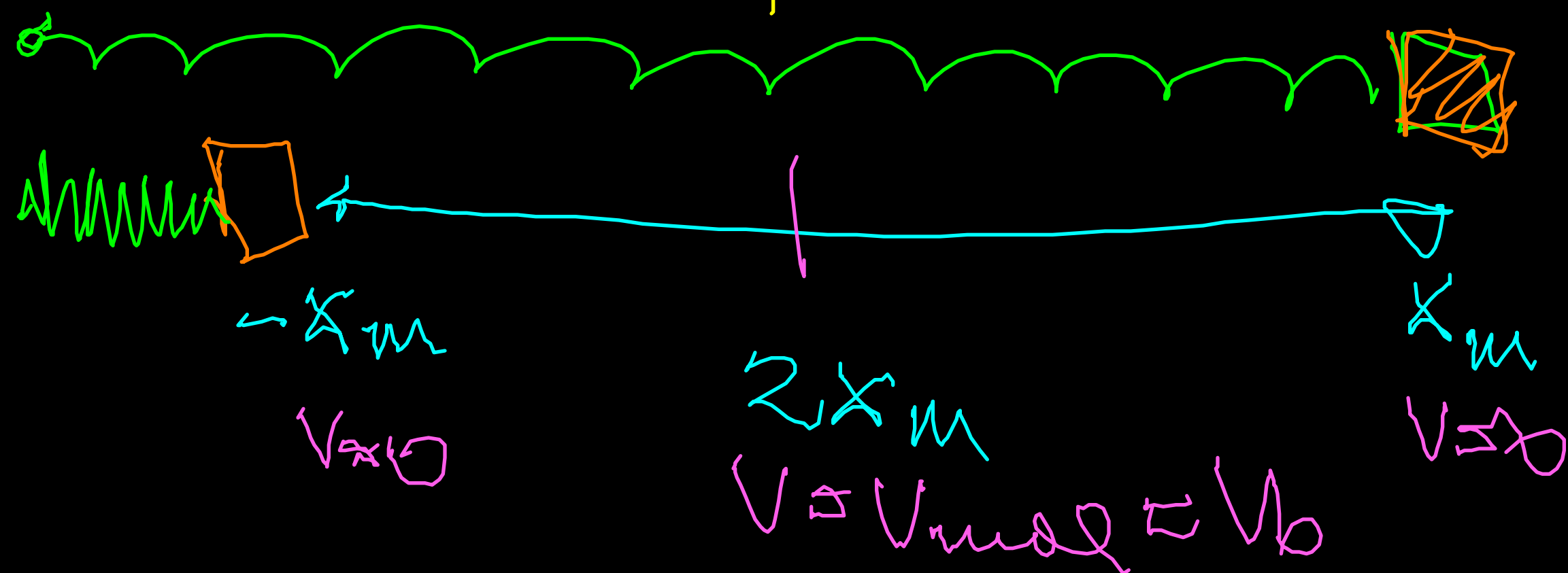
$$E_m = \frac{1}{2} k x_m^2 \quad (x_m)$$

$$E_m = \frac{1}{2} k x_1^2 + \frac{1}{2} m v_1^2 \quad (x_1)$$

$$E_m = \frac{1}{2} m v_0^2 \quad (x=0)$$

$$\frac{1}{2} m v_0^2 = \frac{1}{2} k x_m^2$$

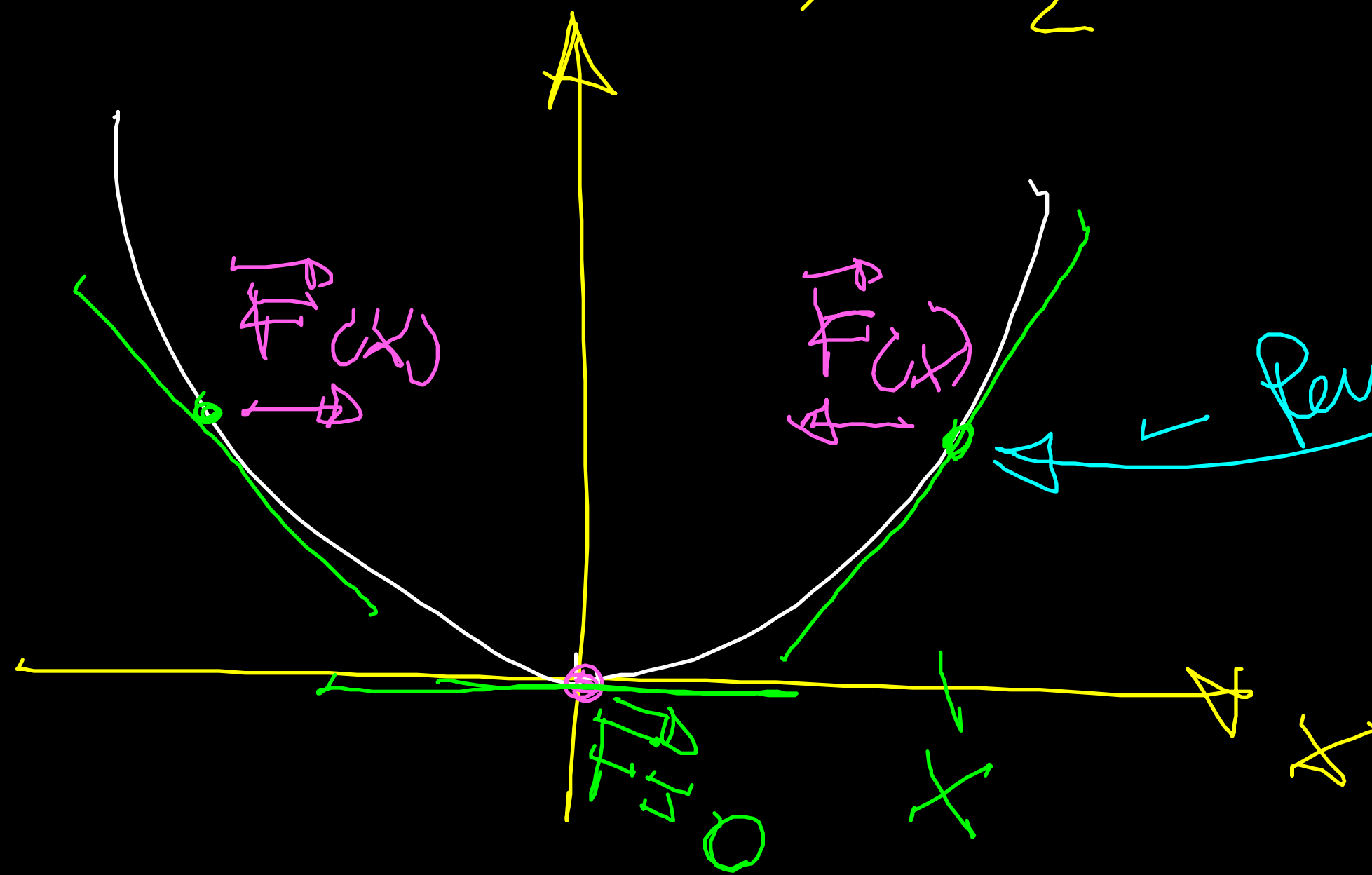
$$v_0 = \sqrt{\frac{k}{m}} \cdot x_m$$



$$U(x) - U(0) = - \int_0^x F(x) dx \Rightarrow U(x) = - \int_0^x F(x) dx$$

$$dU(x) = - F(x) dx$$

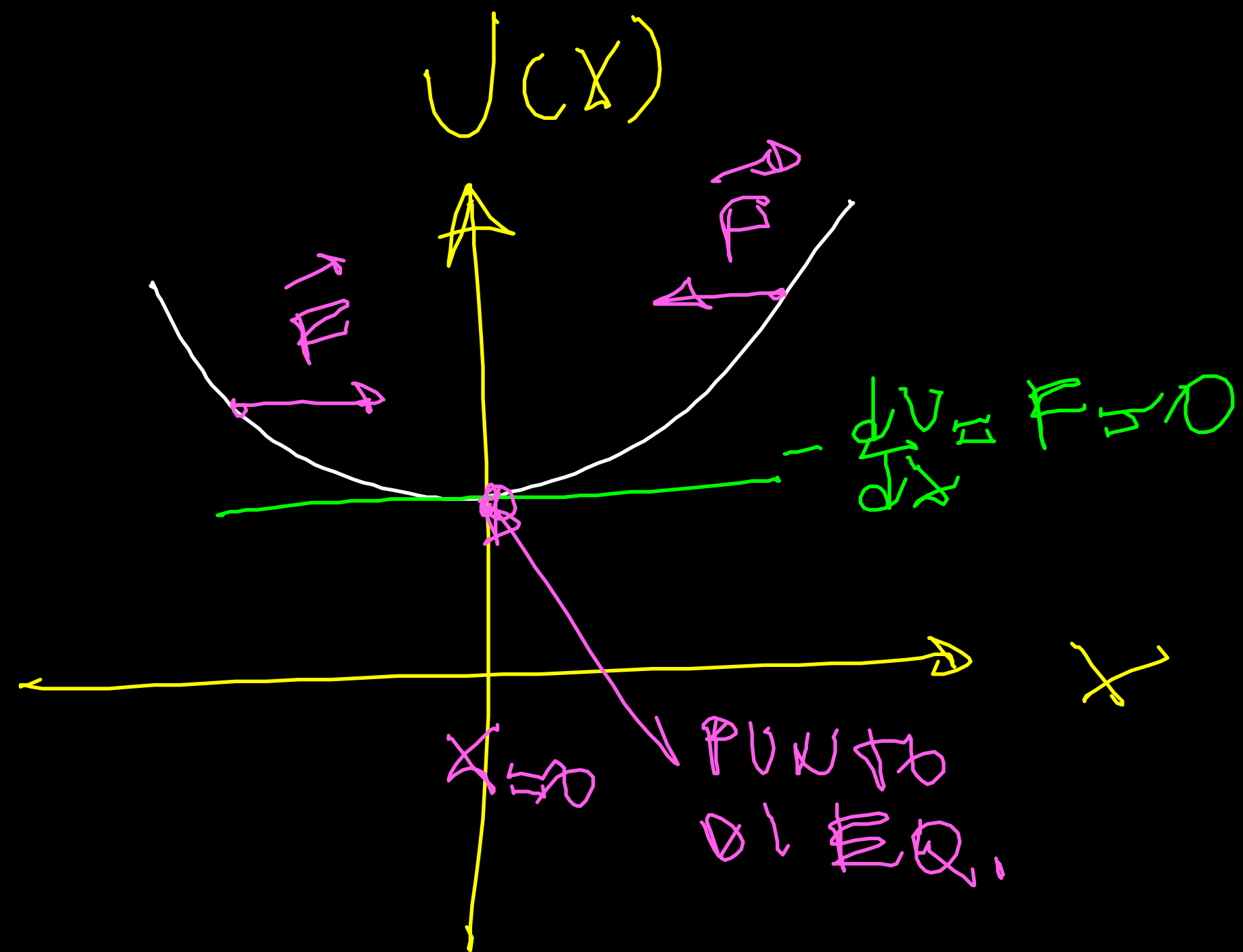
$$U(x) = \frac{kx^2}{2}$$



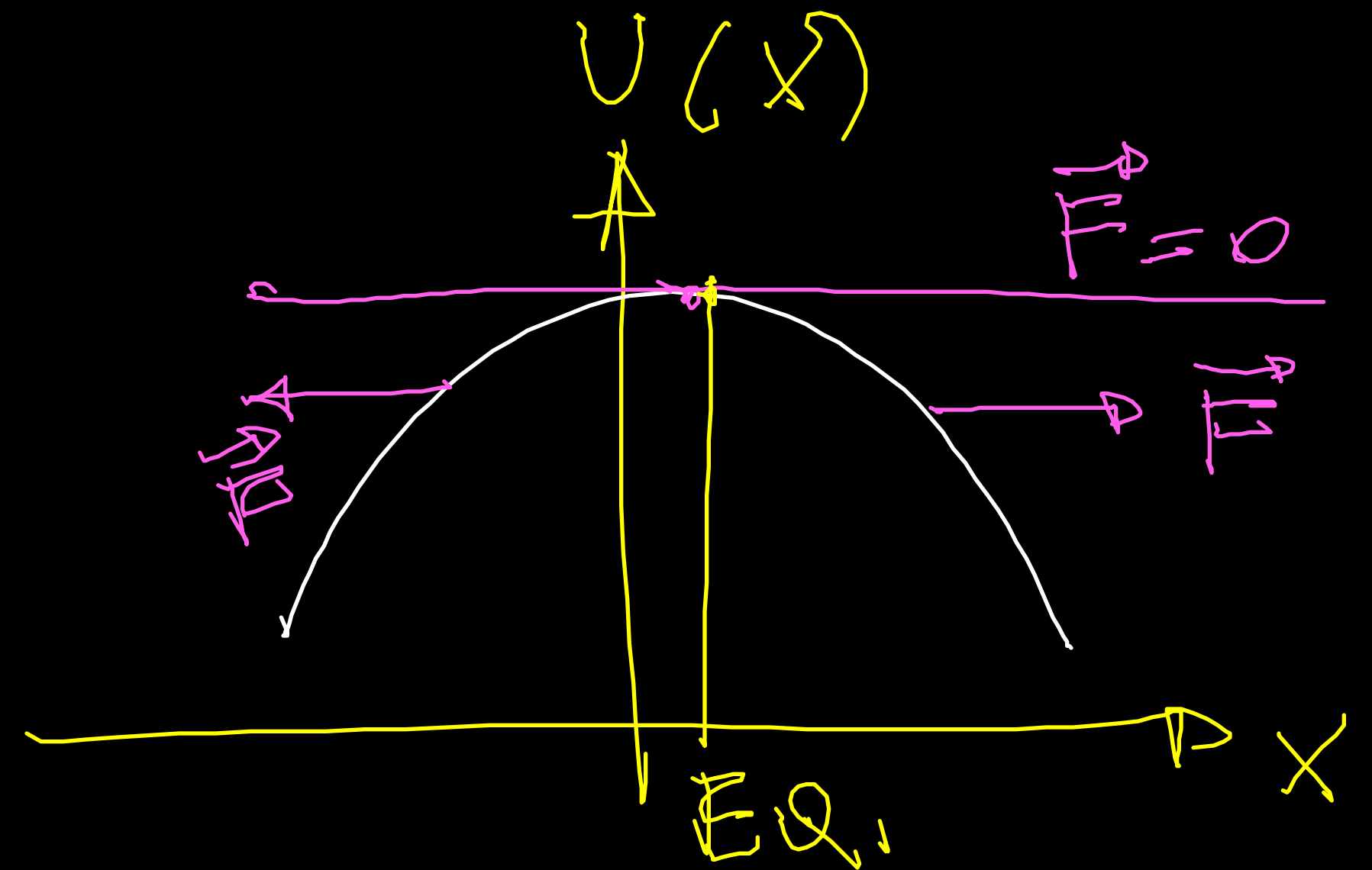
$$F(x) = - \frac{dU(x)}{dx}$$

$$U_{el} = \frac{kx^2}{2} \Rightarrow - \frac{dU}{dx} = - \frac{2kx}{2} = -kx$$

$$U_p = mgy \Rightarrow - \frac{dU}{dy} = -mg$$



EQ. STABILE



EQ. INSTABILE

