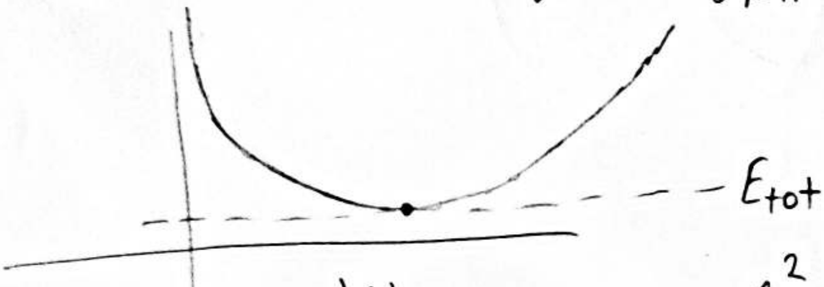
HW #23 CID 6265

(1)

$$U_{eff} = U(r) + U_{cf}(r) = \frac{1}{2}Kr^2 + \frac{\ell^2}{2\mu r^2}$$



$$\frac{dU_{eff}}{dr} = 0 = Kr - \frac{\ell^2}{\mu r^3}$$

$$\boxed{r = \frac{\sqrt{\ell}}{K^{1/4}\mu^{1/4}}}$$

$$F_{cent.} = \frac{\mu v^2}{r} = -Kr + \frac{\ell^2}{\mu r^3}$$

$$\mu \cdot r^2\omega^2$$

$$\frac{\mu r^2 \ell^2}{\mu^2 r^5} = \frac{\ell^2}{\mu r^3}$$

these just cancel out...

$v = r\omega$

$\omega = \dot{\phi}$

$\dot{\phi} = \frac{\ell}{\mu r^2}$

$\dot{\phi}^2 = \frac{\ell^2}{\mu^2 r^4}$

$$\frac{mv^2}{r_1} = -Kr \qquad \mu r\dot{\phi}^2$$

$-kr = 0$ then.

This makes no sense though

Maybe $F_{centripetal}$ is only defined by the force from the spring? Don't include the centrifugal term

$$F_{cent.} = \frac{\mu v^2}{r} = \frac{\ell^2}{\mu r^3} = -kr \qquad r = \frac{(-1)^{1/4}\sqrt{\ell}}{K^{1/4}\mu^{1/4}}$$

2