



Plot for assignment 24 set 7.

Calculation of r_{\min} defined by $U_{\text{eff}}^{\min} = U_{\text{eff}}(r_{\min})$:

$$U'_{\text{eff}}(r) = \frac{\alpha}{r^2} - \frac{L^2}{\mu r^3}$$

$$0 = \alpha - \frac{L^2}{\mu r^{\min}}$$

$$r^{\min} = \frac{L^2}{\alpha \mu} = 1 \quad \text{for} \quad \alpha = \mu = L = 1 .$$

The orbit is a circle with radius $r^{\min} = 1$.