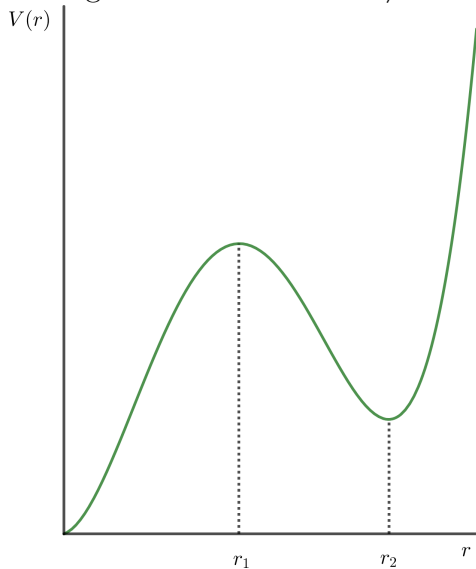


1 Effective Potentials: Graphical Version

Consider a mass μ in the potential shown in the graph below. You give the mass a push so that its initial angular momentum is $\ell \neq 0$ for a given fixed value of ℓ .



- Give the definition of a central force system and briefly explain why this situation qualifies.
- Make a sketch of the graph of the effective potential for this situation.
- How should you push the puck to establish a circular orbit? (i.e. Characterize the initial position, direction of push, and strength of the push. You do NOT need to solve any equations.)
- BRIEFLY discuss the possible orbit shapes that can arise from this effective potential. Include a discussion of whether the orbits are open or closed, bound or unbound, etc. Make sure that you refer to your sketch of the effective potential in your discussions, mark any points of physical significance on the sketch, and describe the range of parameters relevant to each type of orbit. Include a discussion of the role of the total energy of the orbit.