Problem 1

Consider a circumference C and a point P, initially outside of C. Compute the equations of the lines tangent to C that go through P. After having the expression for the tangents, evaluate and discuss them when P is moved inside of C.

Problem 2

Consider a repulsive-central-potential of the form $\frac{k}{r}$ and a mass m with a known total-energy E. The mass is initially located at a distance r_0 of the scattering center. Study the allowed orbits and determine the forbiden region for classic orbits (i.e. points in space that cannot be reached by m with the given initial conditions). Check what happens when you try to find the path that would take you somewhere in the forbiden region.