Name-code: _____

2. Consider the motion of a particle of mass m in an attractive potential

$$V(r) = -Ar^{\alpha}$$

where α is an integer, positive or negative. A is a positive constant. The particle moves in an orbit close to a circular one, with radius r_0. Thus the trajectory has r oscillating around r_0. Calculate the angle θ covered by the particle during a period of oscillations and find the values of α for which this angle is comensurable with 2π. (This is a necessary but not a sufficient condition for the orbits to be closed.)