

We demonstrate the effectiveness of the action-angle variables in the study modern problems of theoretical physics. We start from the simplest example of two-dimensional conformal mechanical systems with dihedral symmetry. We establish, by the use of action-angle variables, (non)equivalence of various systems of this sort, and, particularly, apply this results to the three-particle Calogero models. Then, we construct the spherical and pseudo-spherical generalizations of the superintegrable deformations of two dimensional oscillator and Coulomb system recently suggested by Tremblay, Turbiner and Winternitz and by Post and Winternitz. Then we use them for the analyzes of conformal mechanics conformal mechanics describing the motion of a particle near extreme Kerr, Reisner-Nordstrom and Clement-Galtsov black holes throat.