The goal of this bachelor thesis is to compare numerical methods designed for the determination of scattering length for atomic collisions. We compare numerical solutions calculated by the method of direct integration of the Schrödinger equation, the variable phase equation, the Riccati equation for the scattering length and the method of exterior complex scaling. Methods are tested on the exponential potential and the empirical potential of the Cs-Cs dimer. Calculated scattering lengths are further compared with results from other autors.