Using Lennard-Jones potential to explain force-extension curve measured in AFM:

All the atoms in a particular solid interact via a Lennard-Jones potential (below), with interaction constants $A = 10^{-77}$ J m^6 and B = 10^{-134} J m^{12}. Consider the approach of two such atoms where, as illustrated below, the lower is part of a solid surface and the other is at the end of a fine tip which is slowly brought vertically down. We may model this system as if the top atom is suspended from the end of a spring of effective stiffness K. If $K = 0.1$ N m^{-1}. Schematically show the point(s) at which an instability occurs and the tip `jumps' into contact with the surface. Will there be another instability, and an outward `jump', on separating the surfaces?

Lennard-Jones potential:

$$W(r)=-A/r^6+B/r^{12}$$