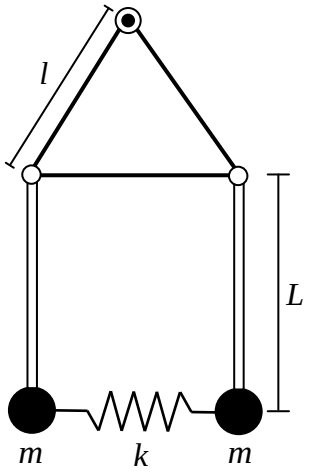
Consider a dynamical system sketched in the figure below. This system consists of

1. A massless rigid frame shaped in the form of an equilateral triangle that can freely rotate about the upper vertex.
2. Two identical pendulums, each consisting of a rigid massless rod and a point mass. Both pendulums can freely rotate about their suspension points shown in the figure;
3. A spring that connects the masses of the pendulums.



Model.

Questions.

Derive analytically the natural frequencies and the mode shapes of the system. Give a graphical interpretation of the derived normal modes.