ADVANCED PHYSICS CLUB

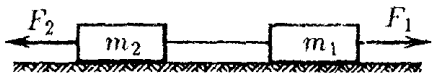
NOVEMBER 3, 2019

Discussed problems

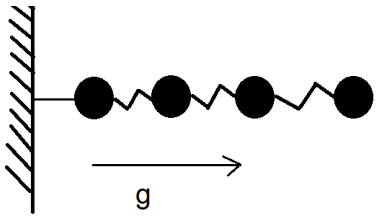
1. Find equilibrium point of a spring suspended from the ceiling with mass M and spring constant k.
2. Wind is blowing horizontally with force F on the mass. Find the equilibrium point.
3. Find equilibrium point of a spring suspended from the ceiling with mass M and spring constant k to which another spring is connected with constant k and another mass M.
4. N springs with constants $k_1, k_2, \ldots, k_N$ are connected in a series from the ceiling. What effective spring can replace them (in the sense of having the same total stretch when a mass is hung at the bottom)?

Homework problems

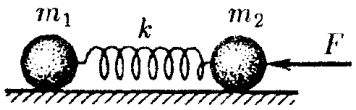
1. Two bodies of masses m_1 and m_2 are connected by a string which withstands tension T (and bigger tension will tear it). Bodies are acted on by forces $F_1 = \alpha t$ and $F_2 = 2\alpha t$, where α is a constant coefficient and t is time. Find the time when the string will be torn.
2. A system consists of N identical balls, connected by identical springs in a line and hanged vertically with a string. Then the string is cut. Find the accelerations of balls immediately after that.
3. Two bodies with masses m_1 and m_2 are connected with a spring with spring constant k. A constant force F acts upon m_2 in the direction of m_1. Find the deformation of the spring if there are no other external forces and oscillations have already stopped. What would accelerations of bodies be immediately after one stops applying the force F?



To homework problem 1



To homework problem 2



To homework problem 3