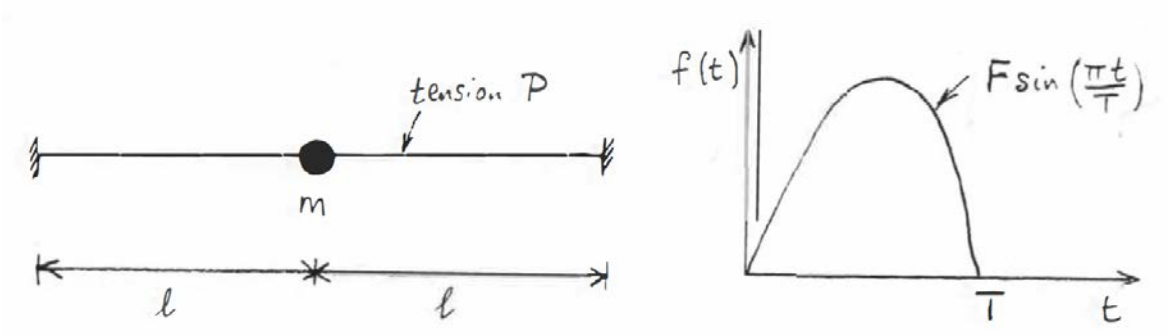
MECH 463 -- Tutorial 11

1. A mass m is secured at the centre of a tight string of length 2ℓ. The tension in the string, P, is not significantly altered by the small lateral vibrations of the mass. A half-sinewave pulse force, f(t), shown in the diagram is applied to the mass. Calculate the natural frequency of this 1-DOF system and its response to the applied force.



2. Two equal masses $m_1 = m_2 = m$ are secured at the one-third points of a tight string of length 3ℓ. As in question 1, the tension in the string, P, is not significantly altered by small lateral vibrations of the masses. The same half-sinewave pulse is applied to m_1 only. Calculate the natural frequencies and mode shapes of this 2-DOF system, and its response to the applied force.