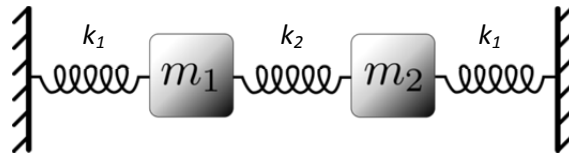# PHY 427 Worksheet Activity #1 – Differential Equations for Coupled Systems

Figures below depict five different systems of particles. For each system, write down differential equations of motion by inspection. Assume that the masses experience only a small perturbation in their position.
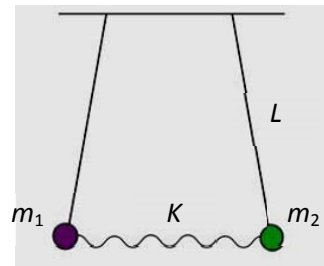
System 1:

$m_1 \ddot{x}_1 =$
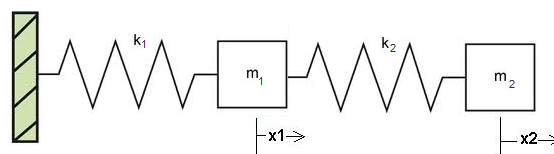
$m_2 \ddot{x}_2 =$

System 2:

$m_1 \ddot{x}_1 =$
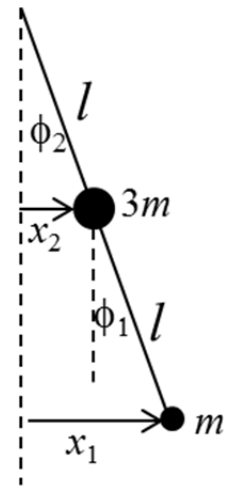
$m_2 \ddot{x}_2 =$

System 3:
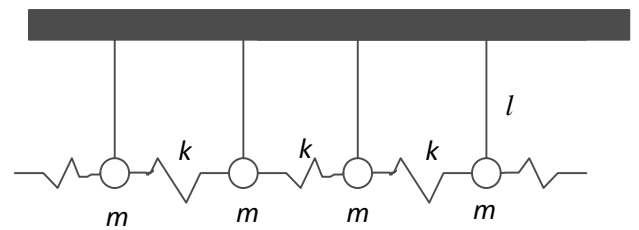
$m_1 \ddot{x}_1 =$

$m_2 \ddot{x}_2 =$

$$m\ddot{x}_1 =$$

$$3m\ddot{x}_2 =$$

$$m\ddot{x}_n =$$

$$m\ddot{x}_{n+1} =$$

$$m\ddot{x}_1 =$$

$$m\ddot{x}_2 =$$

$$m\ddot{x}_3 =$$