Lab 5
ENGR-210
02.16.16
Caleb Wegener

In this lab, moments were examined to see how they act on a body in 3-space by looking at 3 parallel forces. Two of these force vectors were applied at assigned spaces and then by choosing a place on the hardware cloth for the third force vector, an equilibrium system was created. The purpose was to mathematically show that the summation of the moments created by these three forces equaled zero and to become familiar with using the right hand rule to assign the correct sign (+ or -) to the moment force about the origin.

A 2'x2' sheet of hardware cloth was affixed to a tree limb outside of the SciD building. Onto this suspended grid, 3 weights were hung using clips assumed to have a mass of 4g each. The first vector was affixed at the point (16,12,0) and a 100g weight and one 4g clip were used. This vector had a magnitude of 1.02N in the negative z-direction. The second was affixed at (-6,19,0) using a 50g weight and a 4g clip giving a magnitude of 0.51N also in the negative z-direction.

Finally, a space was chosen along x=-13 to hang the third force vector consisting of another 100g weight and 4g clip once again giving a magnitude of 1.02N in the negative z-direction. Affixing this force vector at the point (-13,-20,0) was determined to create an equilibrium system meaning that the moments from the 3 forces equaled 0. Because the string attaching the hardware cloth to the tree was pulling back with an equal and opposite force to the 3 vectors, it was not necessary to look at the summation of the forces in this experiment.

When the moments were calculated and added together it was apparent that these indeed were very close to canceling each other out. Thus, the summation of the moments was zero. This exercise was great because it illustrated how these moments worked in 3-D. It showed how to use the right hand rule to find the + or – sign associated with the moment force of each force vector.