**Physics 207**

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**Title:** Lab 4- Centripetal Motion

**Introduction**

The purpose of this lab is to investigate centripetal force. This is the force that is required for the mass of an object to move in a circular motion and it is acts towards the center of the mass. It consists of the radius of motion and the speed gives rise to ac=v^2/r. We used this formula,

F= mac= (mv^2)

r

In this experiment we will try to verify the relationship between centripetal force and the radius of motion and speed of the masses of an object using a special apparatus. This apparatus indicates that for an object in circular motion, the centripetal force will be mv^2/r.

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We had to measure for T in F= mr(2pi/T)^2 because we need the masses of the object that’s the object at end when its being spun. Also we have to measure the radius find the object is moving in a constant motion or not. Also we had trail1 error while measuring with formula.

**Data and Calculations:** Experiment

**Trial 1:** We got wrong in velocity because we did 1spin with the revolution.

**Steps1:** m=447g or, in SI units, m = 0.447 kg.

* r = 16.m cm or, in SI units, r = 0.165m.
* C = 2\*pi\*r or C = 1.0367 m.
* t = 2.92 seconds.
* v = C/t, which came out to be v = 0.355 m/s.
* F = mv^2 / r, so our F came out to be Fc = 0.34N.

**Trial2:** Now we will try to measure the force the other way, using the spring and the pans.

**Steps1:** r = 0.165m; 6.28s for 10 revolutions; 0.628s / 1 revolution;

* Fc = 0.6kg \* 9.8 m/s^2 = 5.88N;
* F = mv^2 / r = (0.447kg\*(1.65)^2) / 0.165m = 7.37N.

**Steps2:** r = 0.18m; 6.77s for 10 revolutions; 0.677s for 1 revolution;

* c = 1.1309m; mass = 65-g = 0.65kg;
* Fc = 0.65kg\* 9.8m/s^2 = 6.37N;
* F = mv^2/r = (0.447kg\*(1.66)^2) / 0.18 m = 6.9N

**Conclusion**

All results, by this experiment concluded that there exists a relationship between centripetal force and radius and time of revolution. When the centripetal force changed the radius changed or the time of revolution also changed. Any errors we encountered could be explained by our measurement methods or our calculation methods **(Trial1 and Trail2)**.