Vector Addition and Subtraction Report

Your report must include the following: (notice this report is different than usual). You only need to type the cover page. Everything else is handwritten. **Start each part in a separate page and include the headers for each section. You must turn in the report in class.**

0. Cover page **(typed)**

1. Step 1: Graphical Representation

- **a.** Show the Graphical construction **to scale** of the sum **A + B - C.**
- **b.** Include the scale use to graph. Label vectors and angles
- **c.** List the value of the resultant in Newtons.
- **d.** List the angle it makes with the positive X-axis

2. Step 2: Component Method

- **a.** Use the component method to calculate **R** = **A** + **B** - **C**. **Show all the calculation steps.**
- **b.** Calculate the angle it makes with the positive X-axis.
- **c.** List the value of **R** in Newtons.
- **d.** List the angle it makes with the positive X axis.

3. Step 3 : Percent Difference

- **a.** Calculate the percent difference between the values in step 1 and step 2 for the resultant vector.
- **b.** Calculate the percent difference between the values in step 1 and step 2 for the angle.

4. Step 4: Equilibrium Force:

- **a.** Calculate the magnitude of vector **E**
- **b.** Calculate the direction (with respect to the + x-axis) of vector **E**.

Things to consider for this experiment

Step 1:

1. You are converting your vector values from Newtons to cm values to graph them.
2. The scale you are using is **3.5 cm = 1.0 Newton**
3. Draw your vectors neatly and measure your angles carefully.
4. You will read the value of **R** in cm and convert it back to Newtons.
5. Measure the direction that **R** makes with the +X-axis in degrees.

Step 2:

1. All vectors must be in Newtons when performing all calculations.

Step 3:

1. You are comparing the values of **R** in step 1 and step 2. **Remember the magnitudes must be in Newtons and the directions in degrees.**
2. You are calculating a **percent difference**. Refer to the previous handout for questions.

Step 4:

1. Use the average value of **R** and θ to calculate **E** (the equilibrant).
2. Show the steps to obtain the correct value of the direction for **E.**