Title

Names

Introduction

Introduce vectors: what they are, how they are characterized, and how can they be represented graphically and analytically.

Introduce the concepts of resultant and equilibrant vectors, and how the two are related.

Also introduce the concept of equilibrium and how it is represented analytically.

Provide real world applications on how vectors can be applied and used.

This is the section where you need to add references*.

Purpose

Instead of a “hypothesis”, just define the purpose of this lab, which is to predict the equilibrant/resultant vectors using three different methods given two or three vectors.

Method

Divide this section into 2 components: experimental and theoretical. Keep in mind that the concept of equilibrium must be mentioned clearly in each method.

Experimental: Introduce and describe the Force Table system (visual required, most likely reference as well).

Explain how you setup your experimental design (step by step) in order to obtain the equilibrant vector (Method3).

Theoretical:

1) Explain in general how you would obtain the equilibrant vector given 2 vectors using the graphical method (sketch is OK / Method 2).
2) Explain in general how you would obtain the equilibrant vector given 2 vectors using the component notation (Method1)

Results

Results using Method1 (analytical): Apply your method1 steps to your given set of vector and show how you obtained the equilibrant vector using the component notation.

Results using Method2 (graphical): Apply your method2 steps to your given set of vector and show you obtained the equilibrant vector using the graphical method.

Results using Method3 (experimental): State your result.

Include a summary table of your results.
**Discussion**

Considering the theoretical method as the true method, compute the following two quantitative measures for each case (analytical vs experimental and analytical vs graphical) for both magnitude and direction:

Percent Error: \[ PE = \frac{|T-E|}{T} \times 100 \]

Relative Uncertainty: \[ RU = \frac{\Delta x}{x} \times 100 \]

Define all the above calculations/formulae in your report; include the CLASS data table here, and show how you apply PE and RU formula to compute ONE of your PE and RU (since you are doing the same calculation four times, please do NOT show it four times. Simply show your steps ONCE and add a statement like “these calculations are performed for the following three other cases”, or “below are the results of such calculations” or something similar.

Based on the magnitude of each of the above, make **clear statements** on:

1) Accuracy of your results and amount of systematic errors
2) Precision of your results and amount of random errors
3) Then make a last statement on which method is the most accurate and/or precise based on the magnitude and direction results you obtained.

**Conclusion**

Restate your hypothesis/purpose, give your final answer for the theoretical method and state clearly which method is the most precise and the most accuracy based on your analysis above.

**References**

This is where you include the references that you included in your report, using the style of your liking (APA, MLA, AIP).
*Resources on references – You will always need at least three (3) references in your report.

You can use 3 different styles:

**APA**

http://www.umuc.edu/library/libhow/apa_examples.cfm

http://employees.csbsju.edu/proske/nursing/apa.htm

**MLA**

http://www.umuc.edu/library/libhow/mla_examples.cfm

https://owl.english.purdue.edu/owl/resource/747/12/

**AIP**

http://guides.lib.monash.edu/content.php?pid=346637&sid=2835486

http://www.aip.org/pubservs/style/4thed/toc.html

Whichever style you like: just make sure you do it right and that you are consistent with your style.