

**Saint Joseph's Preparatory School
Laboratory Exercise**

Vectors

Name: _____ Section: _____ Period: _____

Determine and write the meanings of the following terms as they relate to vectors:

magnitude, direction, x component, y component, resultant, polar form, component form, additive inverse, equilibrant, inverse tangent, parallelogram, "between the sum and the difference", units.

Be certain that you know and understand the terms above because they will be covered on the next test.

Use the information supplied to determine the following:

⇒ Components of **A**, **B**, **C**, **D**

⇒ Magnitude and direction of **E** and **F**

⇒ (**A** + **B**) Using a *graphical method*. Express the resultant in both polar and component forms.

⇒ (**C** + **D**) Using a *graphical method*. Express the resultant in both polar and component forms.

⇒ (**A** - **D**) Using a *graphical method*. Express the resultant in both polar and component forms.

⇒ (**A** - **B**) Using a *graphical method*. Express the resultant in both polar and component forms.

⇒ The *equilibrant* of (**A** + **B** + **C**). Using a *graphical method*. Express the equilibrant in both polar and component forms.

⇒ **-A**, **-B**, **-C**, draw each vector on graph paper.

You should *check your work using analytical methods*.

Each student must do the following calculations essentially on his own getting help only when absolutely necessary.

Using *analytical methods*, determine the following:

⇒ The magnitudes and directions of **E**, **F**, **G**, **H**.

⇒ (**E** + **F**)

⇒ (**G** + **H**)

⇒ (**E** - **H**)

⇒ (**E** - **F**)

⇒ (**E** + **F** + **G**)

⇒ (**-E**)

⇒ (**-F**)

⇒ (**-G**)

⇒ *Equilibrant* of (**E** + **F** + **G**)

See Instructions on the other side!

Graphical Addition and Subtraction of Vectors

Write a **SHORT** essay including these things:

- The method(s) used to add and subtract vectors graphically.
- Any facts about vector addition that were observed while adding graphically.
- A value judgment regarding the possible precision in graphical addition and subtraction.
- The method(s) used to add and subtract vectors analytically.
- An analysis of the circumstances under which one method would be preferred to the other.