Study Guide

Vectors

The student should know or be able to do the following:

1. Distinguish between *vector* and *scalar* quantities, identify the symbols used to represent each and express the *magnitude* and *direction* of a vector correctly.

2. Explain the commutative property involved in vector addition and determine the difference between two vectors.

3. Apply *graphical* methods to determine the magnitude and direction of resultant vector quantities.

4. Explain the relationship and equivalence between a vector and its components.

5. Apply *mathematical* methods in vector *composition* and vector *resolution* to determine resultants and components; i.e. *Pythagorean Theorem* and *trigonometric* principles.

6. Describe the *equilibrant* within the framework of a system of vectors and determine its numerical value both graphically and mathematically.

7. Correctly draw and interpret vector diagrams in both two and three dimensional coordinate axes.

8. Explain the physical meaning of a *unit* vector, including how it gives directional or spacial orientation to a scalar.

9. Express a vector in unit vector notation, determine the magnitude and direction of a vector expressed in unit vector notation and determine the orthogonal components of a vector.

10. Describe the physical interpretation of scalar *dot* and vector cross products and correctly apply the mathematical principles of vector algebra to determine the value of each product.

11. Use the equivalence between scalar dot product equations (1-18) and (1-20) to determine the angle between two vectors.

12. Use the right-handed system, cross product mnemonic, or determinants to calculate the signs of the vector products of unit vectors.

13. Apply vector algebra to determine the axis angles of a vector in a three-dimensional orthogonal space.

14. Apply the rules of vector cross products to obtain a unit vector oriented perpendicular to two vectors.

NOTE: Review diagrams, graphs, worksheets, applets, films and handout materials.