2.3 Vector Algebra

Reading Assignment: *pp. 11-16*

You understand **scalar** math, but what about **vector** mathematics?

Consider, for example:

A.
B.
C.
D.

A. Arithmetic Operations of Vectors

Q:

A: HO: Arithmetic Operations of Vectors

B. Arithmetic Operations of Vectors and Scalars

Say b is a scalar and $\overline{A}$ is a vector.

Q: What then is $\overline{A}+b$ or $b-\overline{A}$??

A:

C. Multiplicative Operations of Vectors and Scalars

Q: So, does the **multiplication** of scalar b and vector $\overline{A}$ (i.e., $b\overline{A}$ or $\overline{A}b$) have any meaning ?

A:

HO: Multiplicative Operations of Vectors and Scalars

We can now examine a **super-important** concept:

HO: The Unit Vector

D. Multiplicative Operations of Vectors

Q: Can we multiply two **vectors?**

A:

HO: The Dot Product

HO: The Cross Product

HO: The Triple Product

E. Vectors Algebra

Now that we know the rules of vector operations, we can analyze, manipulate, and simplify vector operations!

HO: Example: Vector Algebra

HO: Scalar, Vector, or Neither?

F. Orthogonal and Orthonormal Vector Sets

We can now use vector algebra to write equations that **specify** some relationship between sets of vectors.

HO: Orthogonal and Orthonormal Vector Sets