

Vector Addition Lab

August 25th,2020

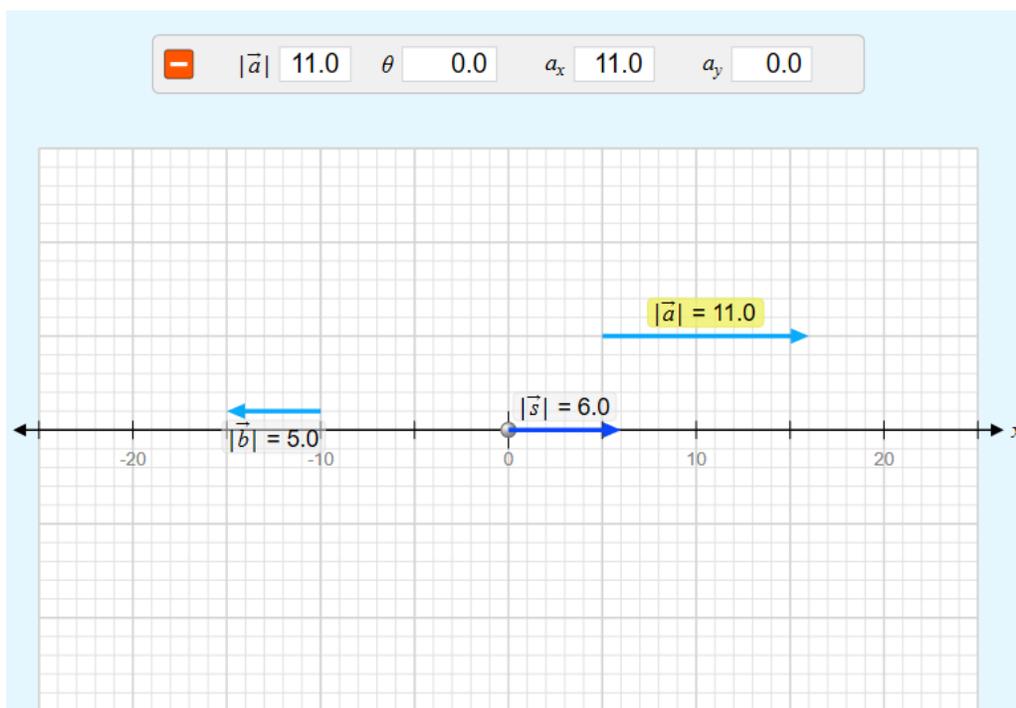
PHYS 211L

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OBJECTIVE

The objective of this lab was to gain understanding of vectors and their function. A vector is a quantity having direction as well as magnitude, especially as determining the position of one point in space relative to another. In this case, a vector is represented by arrows that show magnitude and direction. There are four methods for representing vectors. The first method is by vector addition. There are several ways to add vectors, the first includes expressing both vectors components horizontally and vertically, then add the components together. The second method is to express a vector using the Cartesian coordinate system to identify components that specify the geometry of a vector by way of the coordinate system. The last method of vector addition is to experiment with equations to compare vector sums and differences. In order to do so, one must modify the base vectors and investigate scalar multiplication by altering the coefficients within an equation.

Figure 1.1



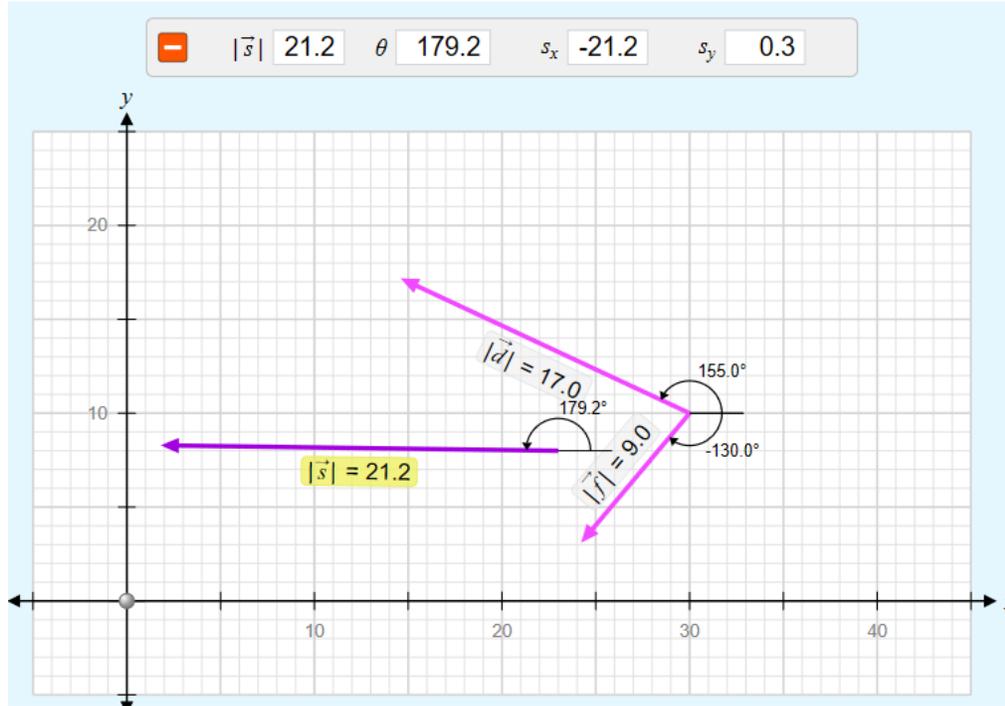
This figure describes Vector A is 11.0 and Vector B is 5.0 but since it is behind zero essentially it is -5.0, therefore the equation is $11.0 - 5.0$ which gives us the sum of 6.0.

Figure 1.2



This image describes vectors, angles and the sum of each vector.

Figure 1.3



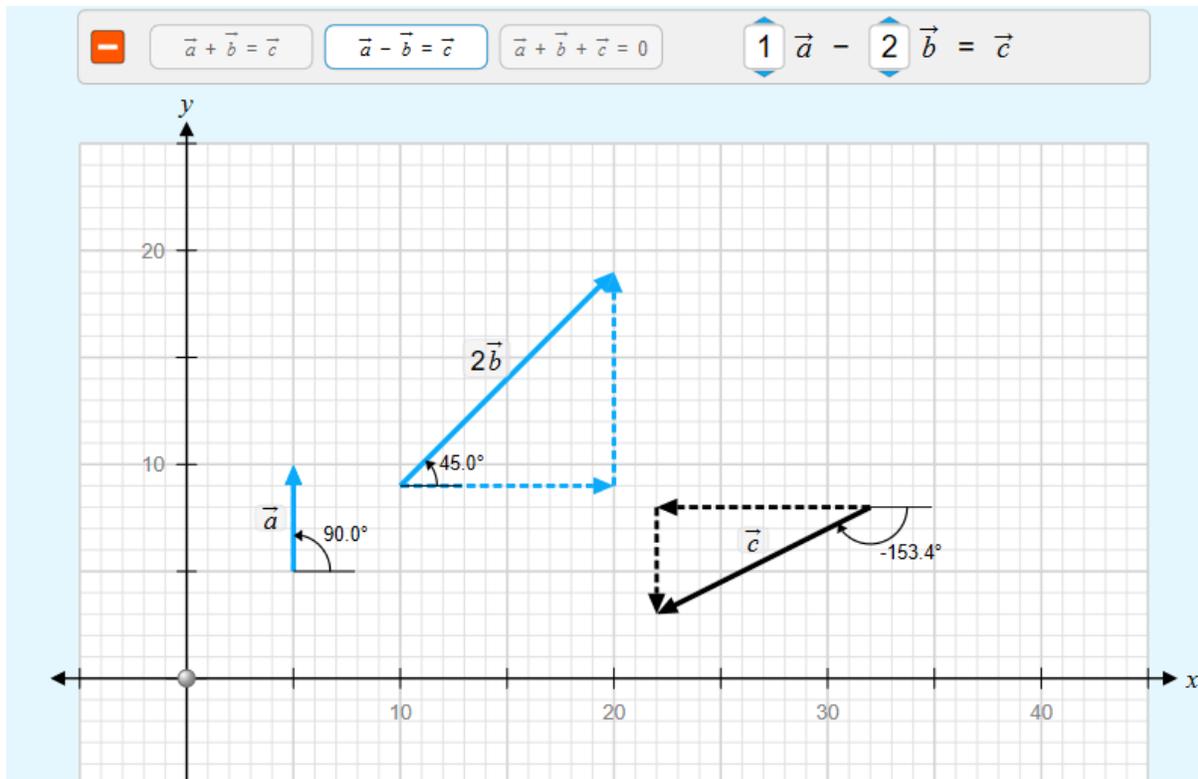
This image describes vectors, angles, and components.

Figure 1.4



This image describes vectors and the sum of those vectors in comparison.

Figure 1.5



This image describes the sum of two vectors as well their comparison.

CONCLUSION

In this experiment students gained a greater understanding of vectors and their components.

Figure 1.1 is a representation of the relationship between vectors and their sums. This figure describes Vector A is 11.0 and Vector B is 5.0 but since it is behind zero essentially it is -5.0, therefore the equation is $11.0 - 5.0$ which gives us the sum of 6.0. In Figures 1.2 and 1.3, vectors, angles, and components of each vector are represented. Figure 1.2 displays the sum of the vectors, as a result Vector B has an angle of 45 degrees and vector C has an angle of 65 degrees. The equation used to find the sum Vectors B and C had a result of -60.3 degrees and 8.1 magnitude. Figure 1.4 displays vector addition and comparison of the sums of the vectors. Finally, figure 1.5 demonstrates a variation of applicable equations for vectors including vectors

that replicate them. The equation and coefficients used is $1a + 2b = \vec{c}$.

All images found in each figure were created and captured using PNET Interactive Simulations™. This lab teaches the student about relationships between different operations and equations involving vectors, angles and magnitudes.