Chapter C2: Vector Practice

Physics I

College of the Atlantic

1.

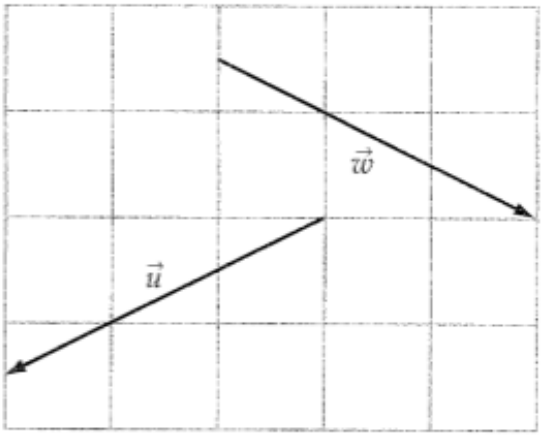

Figure C2.12
Vectors for problems C2T.9 through C2T.11.

C2T.9 Consider the two vectors shown in figure C2.12. The sum of these vectors points most nearly
A. Up. B. Down. C. Right. D. Left.

C2T.10 Consider the two vectors shown in figure C2.12. The vector $\vec{w} - \vec{u}$ points most nearly
A. Up. B. Down. C. Right. D. Left.

C2T.11 Consider the two vectors shown in figure C2.12. To change $\vec{u}$ into $\vec{w}$, one would have to
A. Multiply by -1.
B. Multiply by $120°$.
C. Add the vector $\vec{u} + \vec{w}$.
D. Add the vector $\vec{w} - \vec{u}$.
E. Add the vector $\vec{u} - \vec{w}$.
F. Do none of the above.

2. Let $\vec{D}_1 = [5\text{m}, 4\text{m}]$ and $\vec{D}_2 = [-1\text{m}, -3\text{m}]$.

   (a) Calculate the components of the sum of the two vectors. I.e., find $\vec{D}_1 + \vec{D}_2$.

   (b) Draw $\vec{D}_1$, $\vec{D}_2$, and $\vec{D}_1 + \vec{D}_2$, and convince yourself that the geometric (tip to tail) view of vector addition is the same as the addition formula you just used.

3. Let $\vec{D}_3 = [3\text{m}, -5\text{m}]$ and $\vec{D}_4 = [2\text{m}, -2\text{m}]$.

   (a) Calculate the components of the difference of the two vectors. I.e., find $\vec{D}_4 - \vec{D}_3$.

   (b) Draw $\vec{D}_4$, $\vec{D}_3$, and $\vec{D}_4 - \vec{D}_3$, and convince yourself that the geometric (tip to tail) view of vector addition is the same as the addition formula you just used.

4. Consider the following two vectors:

$$\vec{A} = -4m\hat{x} + 6m\hat{y} \ , \tag{1}$$

$$\vec{B} = 10m, \ 53 \text{ degrees south of east} \ . \tag{2}$$

   (a) What is the magnitude and direction of $\vec{A}$?

   (b) What are the components of $\vec{B}$?

   (c) What is $\vec{A}+\vec{B}$? Express your answer both in components and in magnitude/direction form.

   (d) What is $3\vec{A}$? Express your answer both in components and in magnitude/direction form.

   (e) What is $\vec{A}-\vec{B}$? Express your answer both in components and in magnitude/direction form.