

COMMENT ON PROBLEM SOLVING:

When you write up your solutions, you should have a document that is very helpful to you come exam time. A problem solution that is just some equations, a few lines of algebra, and a couple of numbers not help you study at all. When you study for an exam you want to fully understand the reasoning behind the solution and the best way to describe the reasoning is with words and pictures. You will always see me draw sketches and writing the words that explain what I am doing. I expect you to do the same thing. In summary, a proper problem solution includes:

- A sketch of the important features of the problem.
- A clearly identified coordinate system, if needed.
- A list of known quantities.
- A list of the quantities you intend to find.
- The names of the relevant definitions, laws, and useful relationships you use.
- A written explanation of the reasoning required for the key steps.
- The algebra done first, then the numbers plugged in.
- A clear indication of the final answer (such as a box around it)
- A final written comment about the result.

1. The vector \vec{A} is 5.00m long and the vector \vec{B} is 3.00m long.

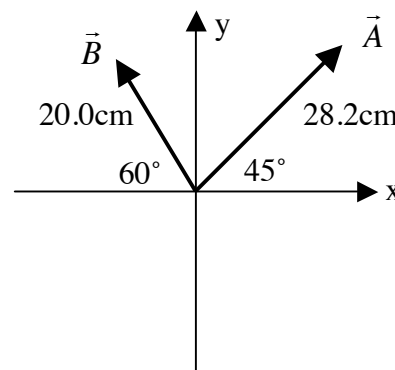
(a) Find the maximum length of $\vec{A} + \vec{B}$ and sketch this situation.

(b) Find the minimum length of $\vec{A} + \vec{B}$ and sketch this situation.

(c) Given that vector \vec{A} is along the x-axis and $\vec{A} + \vec{B}$ is 7.00m long, find the angle that the vector \vec{B} makes with the x-axis.

2. A plane flies 788miles at 48.0° north of east to go from Dallas to Chicago. The plane then travels 560miles at 69.0° south of east to get to Atlanta. Find the distance and direction that a plane would have to travel to go directly from Dallas to Atlanta.

3. A tropical storm was centered 400km away from Honolulu at 30.0° south of east. Six hours later the storm is centered 200km due north of Honolulu. (a) Show the initial position, final position, and displacement at the right. (b) Find the displacement (magnitude and direction) of the storm during this time.



4. For the two vectors shown at the right, (a) sketch $\vec{A} + \vec{B}$, and find (b) $\vec{A} + \vec{B}$ in unit vector form, (c) the magnitude and direction of $\vec{A} + \vec{B}$, (d) $\vec{A} \cdot \vec{B}$, and (e) $\vec{A} \times \vec{B}$.