

Physics 1135 Homework for Recitation 3: Vectors

1. Two vectors are given as $\vec{A} = 4.0\hat{i} + 6.0\hat{j}$ and $\vec{B} = 5.0\hat{i} - 2.0\hat{j}$

a) Sketch the vectors in a diagram and find magnitude and direction of each vector.

b) The vector $\vec{C} = \vec{B} + \vec{A}$. Sketch the vector \vec{C} , express it in unit vector notation, and find its magnitude and direction.

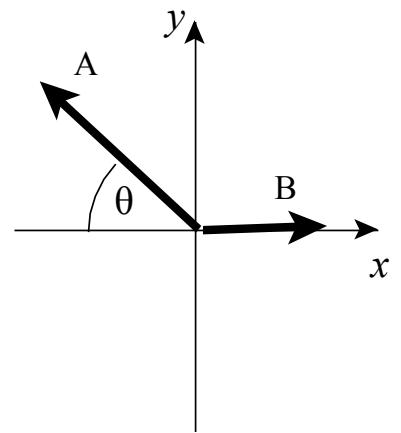
c) The vector $\vec{D} = \vec{B} - \vec{A}$. Sketch the vector \vec{D} , express it in unit vector notation, and find its magnitude and direction.

2. In the figure, the magnitudes of the vectors are $A=5$ and $B=2$. The angle θ equals 30° .

a) Calculate the vector components A_x , A_y , B_x , B_y .

b) The vector $\vec{C} = \vec{B} + \vec{A}$. Sketch vector \vec{C} in the diagram and calculate its components, magnitude, and direction.

c) The vector $\vec{D} = \vec{B} - \vec{A}$. Sketch vector \vec{D} in the diagram and calculate its components, magnitude, and direction.



3. You have found a treasure map that directs you to start at a hollow tree, walk 300 meters directly north, turn and walk 500 meters northeast, and then 400 meters at 60° south of east. Since you have been educated about vectors, you decide to save yourself some walking and go directly to the treasure in a straight line from the hollow tree. How far do you have to go, and in which direction?