

In Lab Problems for Phy241Lab02

(1) A vector \vec{A} is given by $\vec{A}=5\hat{i}+4\hat{j}$. Find the following:

- (a) what is the magnitude of \vec{A} ?
- (b) what is the angle the vector makes with the x-axis?
- (c) what is the angle the vector makes with the y-axis?
- (d) Express this vector using the "hat" notation.
- (e) Express this vector using the "x-y" unit vector notation.

(2) Suppose a vector \vec{B} is given by $\vec{B}=3\hat{i}+2\hat{j}$. Find the following:

- (a) What is $2\vec{B}$?
- (b) What is $\vec{B}+\vec{A}$?
- (c) What is $\vec{B}-\vec{A}$?
- (d) What is $\vec{B}\cdot\vec{A}$? (dot product)
- (e) What is the angle made with respect to the positive x-axis by $\vec{B}+\vec{A}$?

(3) Suppose a vector \vec{C} is given by $\vec{C}=8\hat{i}-9\hat{j}$. A person walks along vector \vec{A} , then vector \vec{B} , followed by vector \vec{C} . At the end of this journey, what is the displacement (vector) and the distance from the origin. You may assume all units are in m here.

(4) The length of the barrel of a dart gun is 1.2 m. Upon leaving the barrel, a dart has a speed of 12 m/s. Assuming that the dart is uniformly accelerated, how long does it take for the dart to travel the length of the barrel?