

Homework #7. Vectors
Assigned: 11/26/12 Due: 12/3/12

1. For the vector, $\vec{v}=3\hat{i}+5\hat{j}+7\hat{k}$ what is the x-component? the y-component? the z-component? what is $\vec{v}\cdot\hat{i}$? $\vec{v}\cdot\hat{j}$? $\vec{v}\cdot\hat{k}$?
2. For the vector, $\vec{v}=3\hat{i}+5\hat{j}+7\hat{k}$ what is $\vec{v}\times\hat{i}$? $\vec{v}\times\hat{j}$? $\vec{v}\times\hat{k}$? $\hat{i}\times\vec{v}$? $\hat{j}\times\vec{v}$? $\hat{k}\times\vec{v}$? $\vec{v}\cdot\vec{v}$? what is $v_x^2+v_y^2+v_z^2$? what is the magnitude of \vec{v} ? what direction is \vec{v} pointing?
3. For the vectors, $\vec{v}=3\hat{i}+5\hat{j}$ and $\vec{w}=5\hat{i}+8\hat{j}$, what is $\vec{v}\cdot\vec{w}$? $\vec{v}+\vec{w}$? $\vec{v}\times\vec{w}$? $\vec{w}\times\vec{v}$?
4. Draw the vector , $\vec{v}=4\hat{i}+3\hat{j}$, on a Cartesian coordinate grid.
5. Draw the vectors , $\vec{v}=4\hat{i}+3\hat{j}$, $\vec{w}=2\hat{i}-6\hat{j}$, and $\vec{v}+\vec{w}$ on a Cartesian coordinate grid. If \vec{v} and \vec{w} were forces acting on a mass, what direction would the mass be accelerating?
6. For the vectors $\vec{r}=4\hat{i}+3\hat{j}$ and $\vec{F}=4\hat{i}+3\hat{j}$, determine the moment, $\vec{v}=4\hat{i}+3\hat{j}$. If this moment were acting on a system of mass, about what axis would the system be rotating?