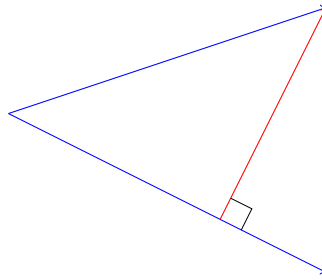# Worksheet 6
Due: Tuesday, September 30

Remember, where appropriate, explain how you got your answers! No calculators are allowed or needed.

1. Let $\vec{x} = (1,3)$, $\vec{y} = (-2,4)$, and $\vec{u} = (1+i, 2-i)$. Compute the following.

   (a) $\text{proj}_{\vec{y}}(\vec{x})$

   (b) $\text{proj}_{\vec{x}}(\vec{y})$

   (c) $\text{proj}_{\vec{x}}(\vec{u})$

   (d) $\text{proj}_{\vec{u}}(\vec{x})$

2. In the picture below, the top blue vector is $v = (6,2)$, the bottom blue vector is $w = (6,-3)$, and the red vector is perpendicular to w. Compute the red vector.

3. If $\vec{v}$ and $\vec{u}$ are orthogonal vectors, what is $\text{proj}_{\vec{u}} \vec{v}$?

4. Let $\vec{v}$ and $\vec{u}$ be vectors. Let $\vec{w} = 2\vec{u}$. What is the relationship between $\text{proj}_{\vec{v}} \vec{u}$ and $\text{proj}_{\vec{v}} \vec{w}$? How about $\text{proj}_{\vec{u}} \vec{v}$ and $\text{proj}_{\vec{w}} \vec{v}$?