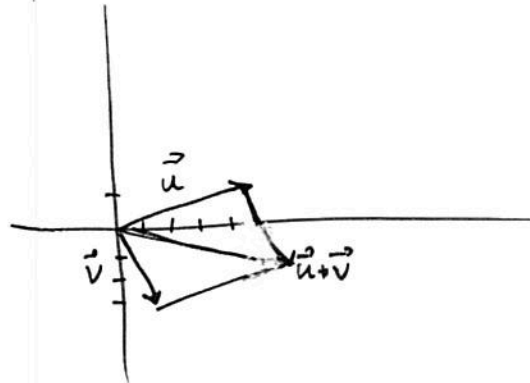**Instructions:** Show all work. Use exact answers unless otherwise asked to round.

1. Use $\vec{u} = \langle 5,1 \rangle$, $\vec{v} = \langle 1,-3 \rangle$ to find the following.

   a.   Find $\vec{u} + \vec{v}$, then graph $\vec{u}$, $\vec{v}$ and $\vec{u} + \vec{v}$ on the same graph.

   $$\vec{u} + \vec{v} = \langle 6, -2 \rangle$$

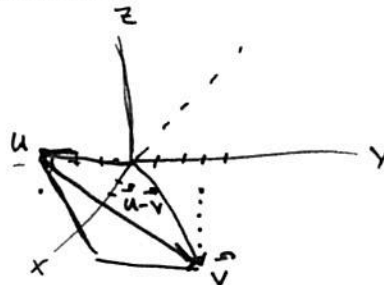
   b. $\|\vec{u}\| = \sqrt{25+1} = \sqrt{26}$

   c.   Write a unit vector in the direction of $\vec{u}$

   $$\frac{\vec{u}}{\|\vec{u}\|} = \left\langle \frac{5}{\sqrt{26}}, \frac{1}{\sqrt{26}} \right\rangle$$

2. Use $\vec{u} = \langle 2,-3,1 \rangle$, $\vec{v} = \langle 1,4,-5 \rangle$ to find the following.

   a.   Find $\vec{u} + \vec{v}$, then graph $\vec{u}$, $\vec{v}$ and $\vec{u} - \vec{v}$ on the same graph.

   $$\vec{u} + \vec{v} = \langle 3, 1, -4 \rangle$$

   b. $\|\vec{u}\| = \sqrt{4+9+1} = \sqrt{14}$

   c.   Write a unit vector in the direction of $\vec{u}$.

   $$\left\langle \frac{2}{\sqrt{14}}, \frac{-3}{\sqrt{14}}, \frac{1}{\sqrt{14}} \right\rangle$$