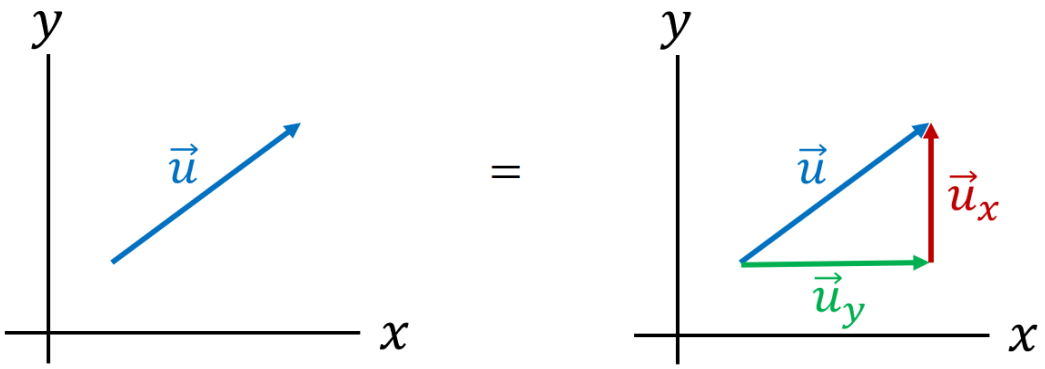
Section 2.3. Components in Two Dimensions

Note. We now desire to decompose vectors in 2 dimensions into horizontal and vertical components. We represent a unit vector in the positive x-axis direction as $\hat{\imath}$ and a unit vector in the positive y axis direction as $\hat{\jmath}$. We then have:

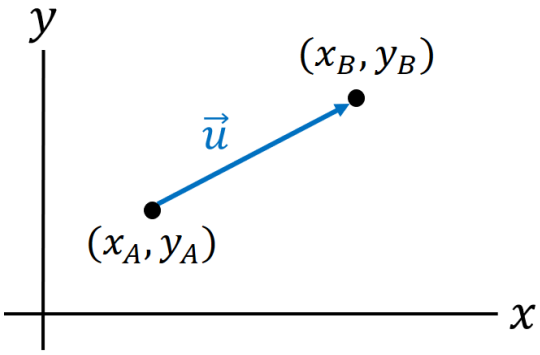


so $\vec{u} = u_x\hat{\imath} + u_y\hat{\jmath}$ where $u_x = |\vec{u}_x|$ and $u_y = |\vec{u}_y|$.

Definition. Above, u_x and u_y are called the *scalar components* of $\vec{u}$. The *magnitude* of $\vec{u}$ is $\sqrt{u_x^2 + u_y^2}$.

Note. If $\vec{u} = u_x\hat{\imath} + u_y\hat{\jmath}$ and $\vec{v} = v_x\hat{\imath} + v_y\hat{\jmath}$ then $\vec{u} + \vec{v} = (u_x + v_x)\hat{\imath} + (u_y + v_y)\hat{\jmath}$.

Definition. The vector from point (x_A, y_A) to point (x_B, y_B) is $\vec{r}_{AB} = (x_B - x_A)\hat{\imath} + (y_B - y_A)\hat{\jmath}$:



Example. Page 37 Numbers 2.38.

Example. Page 37 Numbers 2.51.

Revised: 9/25/2018