www.tomsmath.com

1) You're given u: $u=\langle u_x, u_y \rangle$

2) Find the unit vector along u:

$$\text{unit vector along } u=\left\langle \frac{u_x}{\sqrt{u_x^2+u_y^2}}, \frac{u_y}{\sqrt{u_x^2+u_y^2}} \right\rangle$$

3) Multiply the unit vector along u by the magnitude of $||v||$

$$v=||v||\left\langle \frac{u_x}{\sqrt{u_x^2+u_y^2}}, \frac{u_y}{\sqrt{u_x^2+u_y^2}} \right\rangle$$