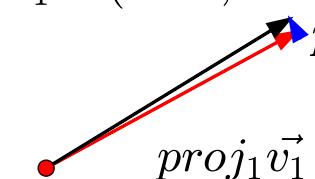
first and and second principal components of $\vec{v_1}$

$\vec{v_1} = (3.38, 2.07)$



$proj_2\vec{v_1} = (-0.10, 0.18)$

$proj_1\vec{v_1} = (3.47, 1.89)$

$(0, 0)$

$\|\vec{v_1}\|^2 = \|proj_1\vec{v_1}\|^2 + \|proj_2\vec{v_1}\|^2$ =

$3.47^2 + 1.89^2 + -0.10^2 + 0.18^2$