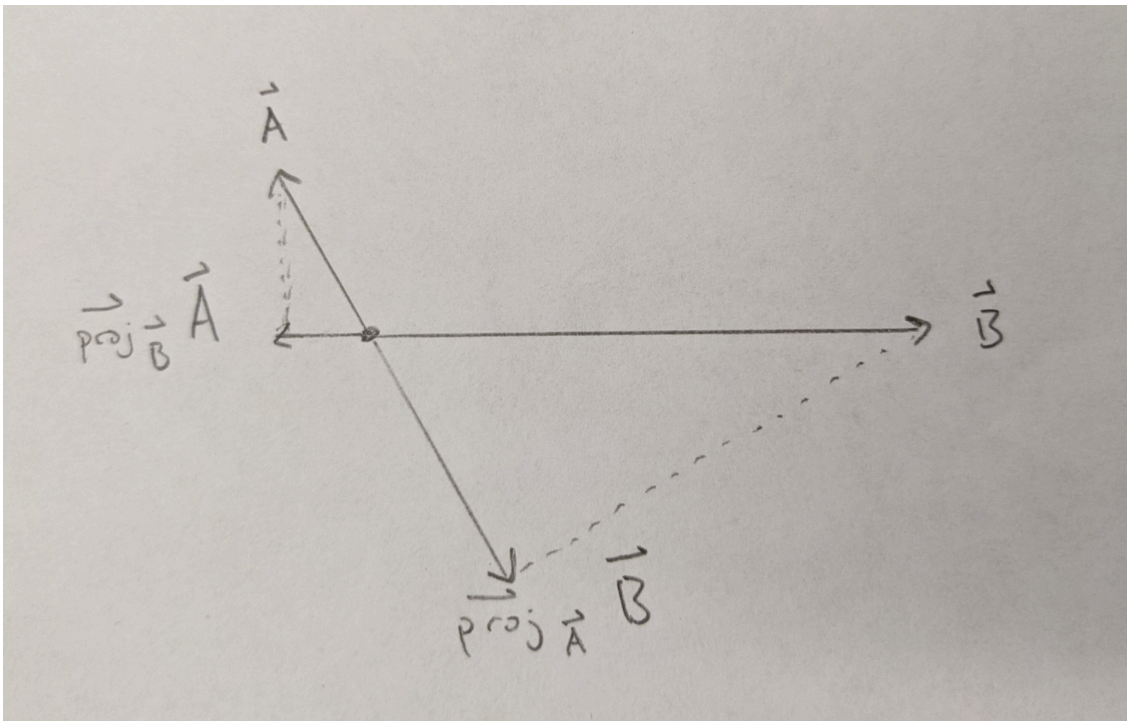
1 | **Problem 1:**

1.1 | **1.1)**



1.2 | **1.2)**

$comp_{\vec{A}}\vec{B} = |\vec{B}|\cos(\theta) = 6\cos(\frac{2\pi}{3}) = -3$ $comp_{\vec{B}}\vec{A} = |\vec{A}|\cos(\theta) = 2\cos(\frac{2\pi}{3}) = -1$

1.3 | **1.3)**

$\vec{A} \cdot \vec{B}$
$= |\vec{A}||\vec{B}|\cos(\theta) = 6 \cdot 2 \cdot (-0.5)$
$= -6$

2 | **Problem 2:**

$comp_{\vec{A}}\vec{B} = |\vec{B}|\cos(\theta)$
$= |\vec{B}|\cos(\theta) \times \frac{|\vec{A}|}{|\vec{A}|}$
$= \frac{|\vec{A}||\vec{B}|\cos(\theta)}{|\vec{A}|}$
$= \frac{\vec{A}\cdot\vec{B}}{|\vec{A}|}$

3 | **Problem 3:**

The projection of $\vec{B}$ onto $\vec{A}$ would be the $\vec{A}$ component of $\vec{B}$ times the unit vector of $\vec{A}$ to give the component a direction and make it a vector: $\vec{proj}_{\vec{A}}\vec{B} = comp_{\vec{A}}\vec{B} \cdot \hat{A}$
$= |\vec{B}| \cos(\theta) \cdot \frac{\vec{A}}{|\vec{A}|}$
$= \frac{|\vec{B}| \cos(\theta)}{|\vec{A}|}\vec{A}$

4 | **Problem 4:**

The vector component of $\tilde{A}$ onto the vector perpendicular to $\tilde{B}$ is the $\vec{proj}_{\perp \tilde{B}}\tilde{A}$