Vectors I

\[ |\vec{f}| = 5 \quad \vec{f} \perp \vec{N} \]
\[ |\vec{w}| = 4 \]

The system is at equilibrium.

1. Express \( \vec{f} \), \( \vec{N} \), and \( \vec{w} \) in component notation.
2. Calculate the resultant vector \( \vec{R} \) defined as \( \vec{R} = \vec{f} + \vec{w} \) in component notation.
3. Deduce \( R \) and \( \theta_R \) (direction).
4. Deduce the equivalent vector \( \vec{E} \) in both magnitude/direction and in component notation.
5. What is the relationship between \( \vec{E} \) and \( \vec{N} \)?
Based on this new coordinate system:
(Same given vectors / same equilibrium conditions)

5. Express $\vec{f}$, $\vec{N}$ and $\vec{W}$ in component notation.

6. Calculate the resultant vector $\vec{R}$ defined as $\vec{R} = \vec{f} + \vec{N}$ in component notation.

7. Deduce the equilibrium vector $\vec{E}$ in component notation.

The system is at equilibrium $\vec{B}$
(i.e. $\vec{F} = \vec{0}$)

$|\vec{C}| = 2$

8. Calculate $|\vec{B}|$ and $|\vec{A}|$. 