7 Parallel component of a vector

Given a vector:

\[
\vec{A} = \begin{bmatrix} 2 \\ 45^\circ \end{bmatrix}
\]

All answers must be express in the \((x,y)\) coordinate system.

1) Express \(\vec{A}\) in component notation.

Using \(\vec{A}_i = (\vec{A} \cdot \hat{e}_i)\hat{e}_i\),

2) Obtain the parallel component \(\vec{A}_i\) of \(\vec{A}\) along the x axis.

3) Obtain the parallel component \(\vec{A}_i\) of \(\vec{A}\) along the y axis.

4) Obtain the parallel component \(\vec{A}_i\) of \(\vec{A}\) along the L direction.

5) Using \(\vec{A} = \vec{A}_i + \vec{A}_\perp\), deduce the perpendicular component \(\vec{A}_\perp\) of \(\vec{A}\) with respect to the direction L.

\((x,y)\) orthonormal coordinate system