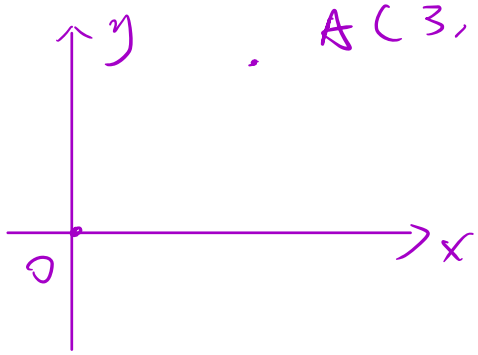
$|\overrightarrow{OA}| = \sqrt{3^2+4^2}$

$= 5$.

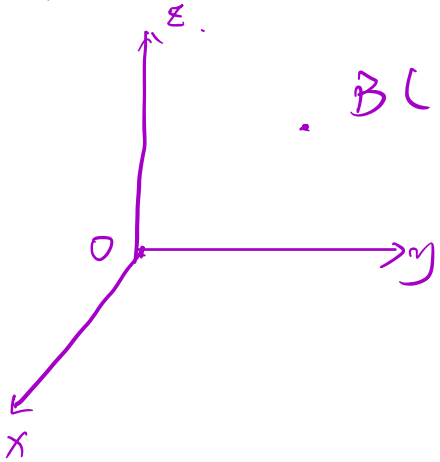


$\overrightarrow{OA} = (3, 4)$

$[3, 4]$

$\|\overrightarrow{OA}\|_2 = \sqrt{3^2+4^2}$

$= 5$.



$\overrightarrow{OB} = (3, 4, 5)$

$[3, 4, 5]$

$|\overrightarrow{OB}| = \sqrt{3^2+4^2+5^2} = \sqrt{\cdots}$

$u = \begin{bmatrix} 1 \\ 2 \end{bmatrix}$. $v = \begin{bmatrix} 3 \\ 4 \end{bmatrix}$. $w = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$

$u + v = \begin{bmatrix} 1+3 \\ 2+4 \end{bmatrix} = \begin{bmatrix} 4 \\ 6 \end{bmatrix}$.

~~$u + w$~~

$u \cdot u = \begin{bmatrix} 1 \\ 2 \end{bmatrix}$

$$p = \begin{bmatrix} 3 \\ 2 \\ 9 \\ 4 \end{bmatrix} \quad q = \begin{bmatrix} 1 \\ 9 \\ 0 \\ 3 \end{bmatrix}$$

① $3q + 2p = \begin{bmatrix} 3\times 1 + 2\times 3 \\ \cdots \\ \cdots \\ \cdots \end{bmatrix} = \begin{bmatrix} 9 \\ 31 \\ 18 \\ 17 \end{bmatrix}$

② $q \cdot q \qquad \|q\|^2 \qquad q'$

③

$$\begin{bmatrix} 1 & 3 \\ 2 & -1 \\ 4 & 7 \end{bmatrix}_{3\times 2} + \begin{bmatrix} 9 & 2 \\ -7 & 6 \\ 3 & 1 \end{bmatrix} = \begin{bmatrix} 10 & 5 \\ \cdots & \cdots \\ \cdots & \cdots \end{bmatrix}_{3\times 2}$$

② $\begin{bmatrix} 1 & 9 \\ 3 & -2 \end{bmatrix}_{2\times 2} = \begin{bmatrix} 2 & 18 \\ \cdots & \cdots \end{bmatrix}_{2\times 2}$

$$A = \begin{bmatrix} 1 & 2 & 5 \\ 3 & 4 & 6 \end{bmatrix}_{2\times 3}$$

$$B = \begin{bmatrix} 1 & 1 \\ 2 & 2 \\ 3 & 3 \end{bmatrix}_{3\times 2} \qquad C = \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \end{bmatrix}_{4\times 1}$$

$A \times B =$

~~$A \times C =$~~

$A_{a\times b} \cdot M_{m\times n}$ $\qquad b = m$.

$A \times M = Z_{a\times n}$

$$A = \begin{pmatrix} 2 & -1 & 0 \\ -1 & 0 & 1 \end{pmatrix} \qquad B = \begin{pmatrix} -3 & 1 \\ 0 & -1 \\ 3 & 1 \end{pmatrix}$$

$$C = A_{2\times 3} B_{3\times 2} = \begin{bmatrix} \quad \end{bmatrix}_{2\times 2}$$

$$D = B_{3\times 2} A_{2\times 3} = \begin{bmatrix} D_{11} & & \\ & & \\ & & \end{bmatrix}_{3\times 3}$$

$$D_{11} = \begin{pmatrix} -3 \\ 1 \end{pmatrix} \cdot \begin{pmatrix} 2 \\ -1 \end{pmatrix} = -7.$$

$2 \times 3 = 3 \times 2.$