

1 Introducing vectors

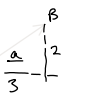
01 October 2024 06:00

- ① • A length (magnitude)
• A direction

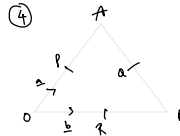
from 1
put to
another

② $i = \begin{bmatrix} 1 \\ 0 \end{bmatrix}$
 $j = \begin{bmatrix} 0 \\ 1 \end{bmatrix}$

$\vec{AB} = a$
Component form
 $5i + 2j$



Column vector
 $\begin{pmatrix} 5 \\ 2 \end{pmatrix} = \begin{bmatrix} 5 \\ 2 \end{bmatrix}$



$\vec{AB} = b$
 $\vec{BA} = -b + a$
 $\vec{OA} = 2a$
 $\vec{OB} = -2b$

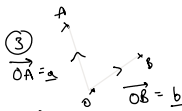
$\vec{BA} = \vec{BO} + \vec{OA}$
 $= -2b + 2a$
 $\vec{BO} = \frac{1}{2}\vec{BA}$
 $= a - b$

$\vec{OA} = 2b - b + a$
 $= b + a$
 $\vec{AB} = \vec{AO} + \vec{OB}$
 $= -2a + b$



Column vector
 $\begin{bmatrix} 8 \\ -1 \\ 7 \end{bmatrix} = \begin{bmatrix} 8 \\ -1 \\ 7 \end{bmatrix}$
Component form
 $8i - j + 7k$
 $i = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$ $j = \begin{bmatrix} 0 \\ 1 \\ 0 \end{bmatrix}$ $k = \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix}$

DONE



$\vec{AB} = \vec{AO} + \vec{OB}$
 $= -\vec{OA} + \vec{OB}$
 $= -a + b$
 $= b - a$