VECTORS

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December 30, 2022

1 10^{th} Maths - Chapter 10

This is Problem-3 from Exercise 10.3

1. Find the projection of the vector $\hat{i} - \hat{j}$ on the vector $\hat{i} + \hat{j}$:

2 SOLUTION

Taken points are $A = (1, -1), B = (1, 1)$

The formula of the projection vector : $\frac{A^t \times B}{\|B\|^2} \times B$

Find the projection vector:

$A^t \times B = (1, -1) \times \begin{pmatrix} 1 \\ 1 \end{pmatrix} = (1 \times 1) + (1 \times -1) = 0$

$\|B\|^2 = (B^t \times B) = (1, 1) \begin{pmatrix} 1 \\ 1 \end{pmatrix} = (1 \times 1) + (1 \times 1) = 2$

projection vector = $\frac{A^t \times B}{\|B\|^2} \times B$

$= \frac{0}{2} \times \begin{pmatrix} 1 \\ 1 \end{pmatrix}$

=(0,0)

projection vector = (0,0)

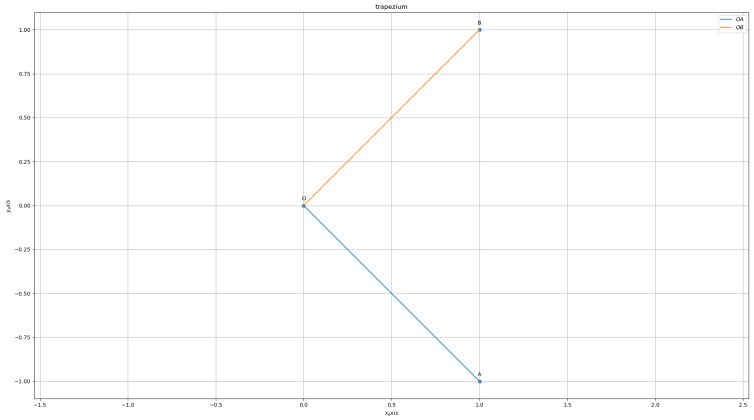
trapezium
OA
OB
B
O
A
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00
−1.5
−1.0
−0.5
0.0
0.5
1.0
1.5
2.0
2.5

Figure 1