Assignment 2

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Find Python Codes from below link

https://raw.githubusercontent.com/jaisai1337/IITH/
main/SU/Assignment2/code.py

and Latex codes from below link

https://raw.githubusercontent.com/jaisai1337/IITH/
main/SU/Assignment2/main.tex

1 EXAMPLES 1

1.1 Question 1

Prove that the points are the vertices of parallelogram

$$\begin{pmatrix} -2 \\ -1 \end{pmatrix}, \begin{pmatrix} 1 \\ 0 \end{pmatrix}, \begin{pmatrix} 4 \\ 3 \end{pmatrix}, \begin{pmatrix} 1 \\ 2 \end{pmatrix} \qquad (1.1.1)$$

1.2 Solution

Prove that opposite sides are parallel

$$AB \parallel CD \qquad (1.2.1)$$

From (1.2.1)

$$AB \parallel CD = (A - B) = \pm(C - D) \qquad (1.2.2)$$

$$(A - B) = \begin{pmatrix} -2 \\ -1 \end{pmatrix} - \begin{pmatrix} 1 \\ 0 \end{pmatrix} \qquad (1.2.3)$$

$$= \begin{pmatrix} -3 \\ -1 \end{pmatrix} \qquad (1.2.4)$$

$$(C - D) = \begin{pmatrix} 4 \\ 3 \end{pmatrix} - \begin{pmatrix} 1 \\ 2 \end{pmatrix} \qquad (1.2.5)$$

$$= \begin{pmatrix} 3 \\ 1 \end{pmatrix} \qquad (1.2.6)$$

$$(A - B) = -(C - D) \qquad (1.2.7)$$

$$AB \parallel CD \qquad (1.2.8)$$

$$AD \parallel BC = (A - D) = \pm(B - C) \qquad (1.2.9)$$

$$(A - D) = \begin{pmatrix} -2 \\ -1 \end{pmatrix} - \begin{pmatrix} 1 \\ 2 \end{pmatrix} \qquad (1.2.10)$$

$$= \begin{pmatrix} -3 \\ -3 \end{pmatrix} \qquad (1.2.11)$$

$$(C - D) = \begin{pmatrix} 1 \\ 0 \end{pmatrix} - \begin{pmatrix} 4 \\ 3 \end{pmatrix} \qquad (1.2.12)$$

$$= \begin{pmatrix} -3 \\ -3 \end{pmatrix} \qquad (1.2.13)$$

$$(A - B) = (C - D) \qquad (1.2.14)$$
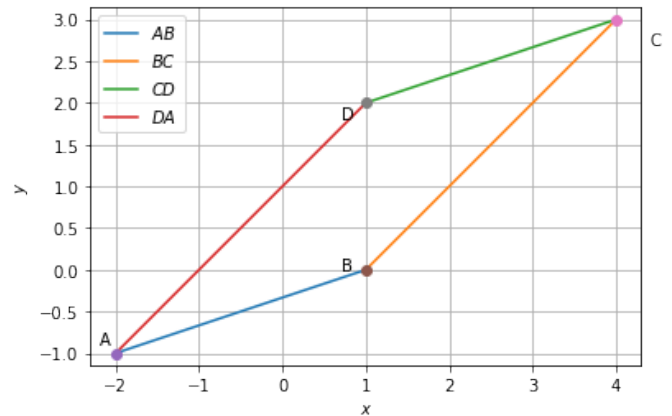
$$AD \parallel BC \qquad (1.2.15)$$

Fig. 0