

ASSIGNMENT-3

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Download all python codes from

[https://github.com/CRAMYATULASI/
ASSIGNMENT_2/tree/main/ASSIGNMENT2/
CODES](https://github.com/CRAMYATULASI/ASSIGNMENT_2/tree/main/ASSIGNMENT2/CODES)

and latex-tikz codes from

[https://github.com/CRAMYATULASI/
ASSIGNMENT_2/tree/main/ASSIGNMENT2](https://github.com/CRAMYATULASI/ASSIGNMENT_2/tree/main/ASSIGNMENT2)

1 QUESTION NO-2.30

Draw JUMP with $JU=3.5$, $UM=4$, $MP=5$, $PJ=4.5$ and $PU=6.5$.

2 SOLUTION

Given,

$$JU = 3.5, UM = 4, MP = 5, PJ = 4.5, PU = 6.5. \quad (2.0.1)$$

Now,

$$JU = \|J - U\| = 3.5 \quad (2.0.2)$$

$$UM = \|U - M\| = 4 \quad (2.0.3)$$

$$MP = \|M - P\| = 5 \quad (2.0.4)$$

$$PJ = \|P - J\| = 4.5 \quad (2.0.5)$$

$$PU = \|P - U\| = 6.5 \quad (2.0.6)$$

- 1) We know, a quadrilateral is a polygon with 4 sides if we have four points they will not form a quadrilateral if any three points are collinear. $\triangle PMU$ and $\triangle PJU$ are two triangles of given quadrilateral. Let us consider $\triangle PMU$ -

$$\|U - M\| + \|P - U\| = 10.5 > \|M - P\| \quad (2.0.7)$$

$$\|P - U\| + \|M - P\| = 11.5 > \|U - M\| \quad (2.0.8)$$

$$\|U - M\| + \|M - P\| = 10 > \|P - U\| \quad (2.0.9)$$

Triangle inequality is satisfied. $\therefore \triangle PMU$ can be constructed. Similarly, Now we consider $\triangle PJU$

$$\|P - J\| + \|J - U\| = 8.0 > \|P - U\| \quad (2.0.10)$$

$$\|J - U\| + \|P - U\| = 10.0 > \|P - J\| \quad (2.0.11)$$

$$\|P - U\| + \|P - J\| = 11.0 > \|J - U\| \quad (2.0.12)$$

Triangle inequality is satisfied. $\therefore \triangle PJU$ can be constructed. \therefore Given sides form a quadrilateral. Vertices of quadrilateral JUMP: Now from $\triangle PJU$, the sides of $\triangle PJU$ are known Which means vertices P, J and U can be obtained using example 1.3 Similarly, the vertices of $\triangle PMU$ can be obtained using example 1.3 \therefore Vertices of given Quadrilateral JUMP can be written as,

$$P = \begin{pmatrix} 0 \\ 0 \end{pmatrix}, J = \begin{pmatrix} 4.5 \\ 0 \end{pmatrix}, U = \begin{pmatrix} 5.58 \\ 3.33 \end{pmatrix}, M = \begin{pmatrix} 3.94 \\ 3.07 \end{pmatrix} \quad (2.0.13)$$

Plot of the Quadrilateral JUMP :

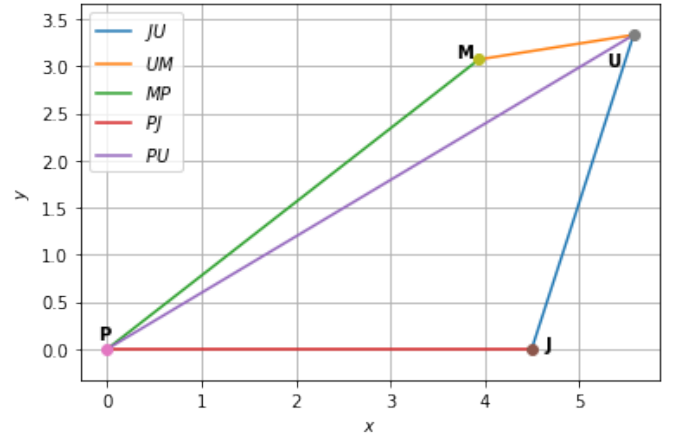


Fig. 2.1: Quadrilateral JUMP