Assignment 3

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Download all python codes from

https://github.com/Abhishek7008/Assignment−3.git

and latex-tikz codes from

https://github.com/Abhishek7008/Assignment−3.git

Question taken from

https://github.com/gadepall/ncert/blob/main/linalg/construction/gvv ncert constr.pdf Q.no.2.11

1 Construction Exercise 2.11

Construct PLAN where $PL = 4$; $LA = 6 : 5$, $\angle$ P $= 90°$, $\angle$A $= 110°$ *and* $\angle$ N $= 85°$.

2 Solution

The basic property of quadrilateral is that

Lemma 2.1.
A quadrilateral should be closed shape with 4 sides

Lemma 2.2.
All the internal angles of a quadrilateral sum up to 360°

Where quadrilateral PLAN has is constructed considering following parameters

$$PL = 4cm,$$

$$LA = 6.5cm,$$

$$\angle P = 90°$$

$$\angle A = 110°$$

$$\angle N = 85°$$

The quadrilateral was plotted with given parameters, Co-ordinates were found to be

$$\mathbf{P} = \begin{pmatrix} 0 \\ 0 \end{pmatrix}$$

$$\mathbf{L} = \begin{pmatrix} 4 \\ 0 \end{pmatrix}$$

$$\mathbf{A} = \begin{pmatrix} 5.5 \\ 6.3 \end{pmatrix}$$

$$\mathbf{N} = \begin{pmatrix} 0.5 \\ 4.0 \end{pmatrix}$$

Based on the co-ordinates, The value of angle E was calculated

$$\angle L = 75°$$

Now, The sum of all angles should be 360°if PLAN is a quadrilateral, Then

$$\implies \angle P + \angle L + \angle A + \angle N = 360°$$

$$\implies 90° + 75° + 110° + 85° = 360°$$

Thus, The figure plotted with given parameters fulfills the criterion, i.e the sum of angles of a quadrilateral should be 360°, Thus we can plot the quadrilateral with given parameters.

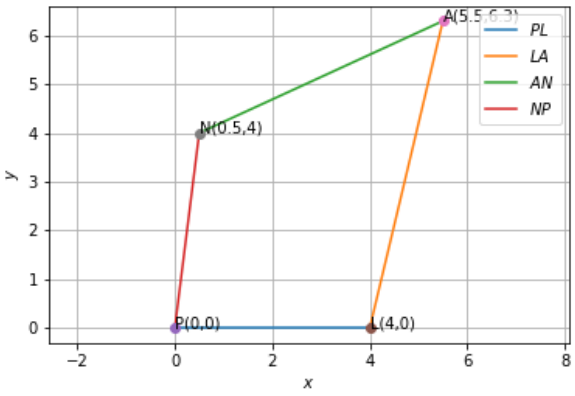

Fig. 2.1: Quadrilateral PLAN