Assignment - 3

Padmanabh
MD/2020/708

Download all and latex-tikz codes from

svn co https://github.com/Padmanabhk1/Assignment−3.git

Question taken from

https://github.com/gadepall/ncert/blob/main/linalg/construction/gvv_ncert_constr.pdf− example 2.7

1 Question

Construct a quadrilateral MIST where $MI = 3.5, IS = 6.5, \angle M = 75°, \angle I = 105°$ and $\angle S = 120°$

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°

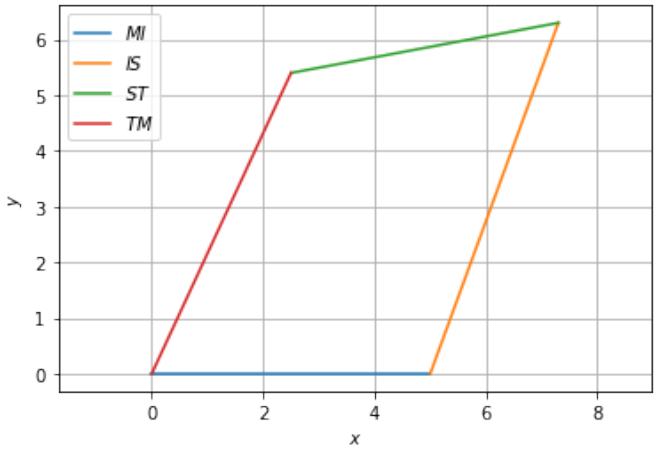
Let us consider first case, Where quadrilateral MIST has is constructed considering following parameters

$$\text{MI} = 3.5 \text{ cm}, \tag{1}$$
$$\text{IS} = 6.5 \text{ cm}, \tag{2}$$
$$\angle M = 75°, \tag{3}$$
$$\angle I = 105° \tag{4}$$
$$\angle S = 120° \tag{5}$$

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

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

$$\mathbf{I} = \begin{pmatrix} 5 \\ 0 \end{pmatrix}$$



$$\mathbf{S} = \begin{pmatrix} 7.3 \\ 6.3 \end{pmatrix}$$

$$\mathbf{T} = \begin{pmatrix} 2.5 \\ 5.4 \end{pmatrix}$$

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

$$\angle T = 55°$$

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

$$\angle M + \angle I + \angle S + \angle T = 360°$$

75+110+120+55 = 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.