ASSIGNMENT-3

Find the python code from below link

https://raw.githubusercontent.com/TGURUBALAJI/INTERNSHIP-IITH/main/Assignment%20-3/code.py

Find the Latex code from below link

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1 QUESTION NO-3

$(-3,-2)$ and $(-6,7)$, the axes being inclined at 60°.

Solution : A=$\begin{pmatrix}-3\\-2\end{pmatrix}$, B =$\begin{pmatrix}-6\\7\end{pmatrix}$

axes being incline at 60° formula for linear transformation from angular coordinates $X = PX_n$

where X = coordinates in linear coordinates (1.0.1)

X_n = *Angular coordinates* (1.0.2)

$$\mathbf{P} = \begin{pmatrix}1 & \cos(\theta)\\0 & \sin(\theta)\end{pmatrix} \tag{1.0.3}$$

$$\mathbf{A} = \begin{pmatrix}1 & \cos(60°)\\0 & \sin(60°)\end{pmatrix}\begin{pmatrix}-3\\-2\end{pmatrix} \tag{1.0.4}$$

$$\mathbf{A} = \begin{pmatrix}-3-2\cos(60°)\\-2\sin(60°)\end{pmatrix} \tag{1.0.5}$$

$$\mathbf{B} = \begin{pmatrix}1 & \cos(60°)\\0 & \sin(60°)\end{pmatrix}\begin{pmatrix}-6\\7\end{pmatrix} \tag{1.0.6}$$

$$\mathbf{B} = \begin{pmatrix}-6+7\cos(60°)\\7\sin(60°)\end{pmatrix} \tag{1.0.7}$$

distance between two points is given by

$$\text{A-B} = \begin{pmatrix}-3-2\cos(60°)\\-2\sin(60°)\end{pmatrix} - \begin{pmatrix}-6+7\cos(60°)\\7\sin(60°)\end{pmatrix}$$

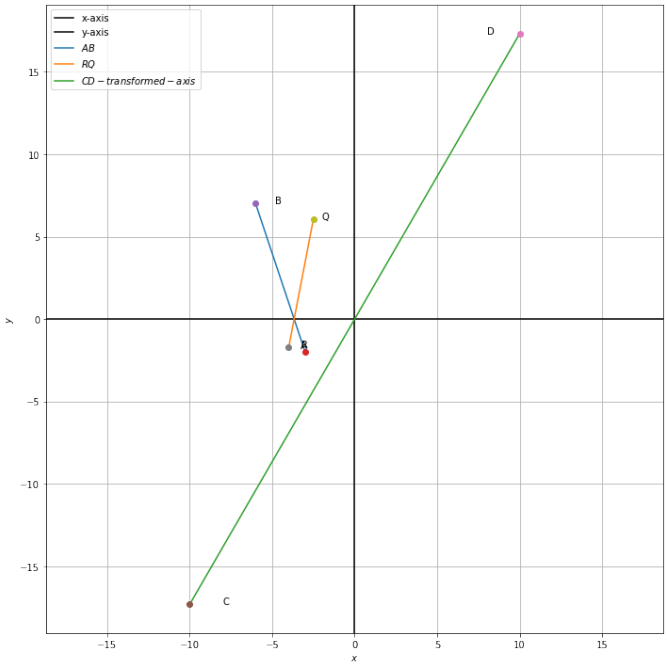

Fig. 0: *transformed lines*

$$\text{A-B} = \begin{pmatrix}3-9\cos(60°)\\-9\sin(60°)\end{pmatrix}$$

$$\|\mathbf{A}-\mathbf{B}\| = \sqrt{\begin{pmatrix}3-9\cos 60° & -9\sin 60°\end{pmatrix}\begin{pmatrix}3-9\cos(60°)\\-9\sin(60°)\end{pmatrix}}$$

$$\|\mathbf{A}-\mathbf{B}\| = \sqrt{(3-9\cos 60°)^2 + (-9\sin 60°)^2)}$$

$$\|\mathbf{A}-\mathbf{B}\| = \sqrt{9+81\cos^2 60° - 54\cos 60 + 81\sin^2 60°)}$$

$$\|\mathbf{A}-\mathbf{B}\| = \sqrt{9+81-54\cos 60}$$

$$\|\mathbf{A}-\mathbf{B}\| = \sqrt{90-27}$$

$$\|\mathbf{A}-\mathbf{B}\| = \sqrt{63}$$

$$\|\mathbf{A}-\mathbf{B}\| = 7.9372$$

Distance between two points is 7.9372 .