Assignment No.2

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Download all python codes from

https://github.com/Vallidevibolla/Assignment−2−1/blob/main/code.py

and latex-tikz codes from

https://github.com/Vallidevibolla/Assignment−2−1/blob/main/main.tex

Question taken from

https://github.com/gadepall/ncert/blob/main/linalg/vectors/gvv_ncert_vectors.pdf− Q.no.2.25

1 Question No.2.25

Find a point on the y-axis which is equidistant from the points A=$\begin{pmatrix}6\\5\end{pmatrix}$ and B=$\begin{pmatrix}-4\\3\end{pmatrix}$

2 Solution

Given,

$$\mathbf{A} = \begin{pmatrix}6\\5\end{pmatrix} \tag{2.0.1}$$

$$\mathbf{B} = \begin{pmatrix}-4\\3\end{pmatrix} \tag{2.0.2}$$

Since the required point is in y-axis, its x-coordinate will be zero

Let the required point = C$\begin{pmatrix}0\\y\end{pmatrix}$

Given the point on y-axis is equidistance from A and B

Distance between two points given as

$$d = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2} \tag{2.0.3}$$

$\therefore$ AC=BC

$$\boxed{\sqrt{(x_3-x_1)^2+(y_3-y_1)^2} = \sqrt{(x_3-x_2)^2+(y_3-y_2)^2}}$$

$$\sqrt{(0-6)^2+(y-5)^2} = \sqrt{(0-(-4))^2+(y-3)^2}$$

Squaring on both sides

$$\implies (y-5)^2+36 = (y-3)^2+16 \tag{2.0.4}$$

$$\implies y^2+25-10y+36 = y^2+9-6y+16 \tag{2.0.5}$$

$$\implies 61-10y = 25-6y \implies 4y = 36 \tag{2.0.6}$$

$$\implies \boxed{y = 9} \tag{2.0.7}$$

Finally the point 'C' on y-axis eqidistance from A and B is $\begin{pmatrix}0\\9\end{pmatrix}$

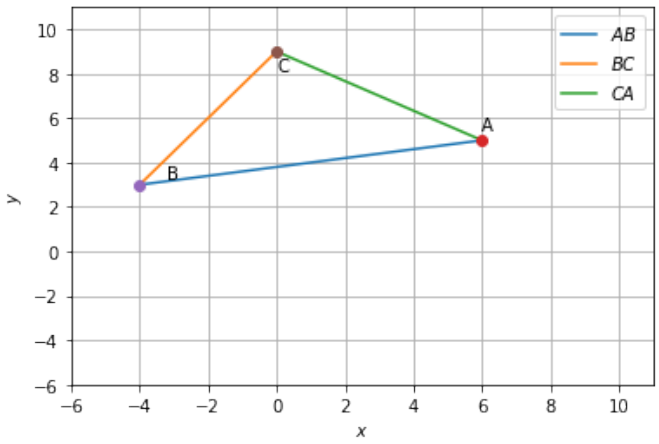

Fig. 2.1: Fig. 2.25