Assignment 1

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CE20RESCH13001

PROBLEM II (2I)

Find the distance between points (7,6) and (4,5) with the axes at 60°

1 SOLUTION

Let the points be P_1 (7,6) and P_2 (4,5) and also the angle between axes is 60°
Projection of the line joining P_1 and P_2 on x-axis is a = 7-4 = 3 units
Projection of the line joining P_1 and P_2 on y-axis is b = 6-5 = 1 unit

$$a = 3, b = 1 \qquad (1.0.1)$$

Let the distance between points P_1 and P_2 be 'c'. As per the cosine law, we have

$$c^2 = a^2 + b^2 - 2ab\cos(C) \qquad (1.0.2)$$

where,
'C' is angle opposite to the side P_1P_2 and is equal to $180° - 60° = 120°$
From equations (1.0.1) and (1.0.2), we get
$c^2 = 1^2 + 3^2 - 2 * 1 * 3 * \cos(120°)$
$= 1 + 9 + 3 = 13$
$c = \sqrt{13} = 3.605$
Therefore the distance between the given points is 3.605 units
*Python code file

https://github.com/Prithvi−Sangani/
    SM5083_Assignment1/blob/main/
    Assignment1.ipynb

*LaTeX document file

https://github.com/Prithvi−Sangani/
    SM5083_Assignment1/blob/main/
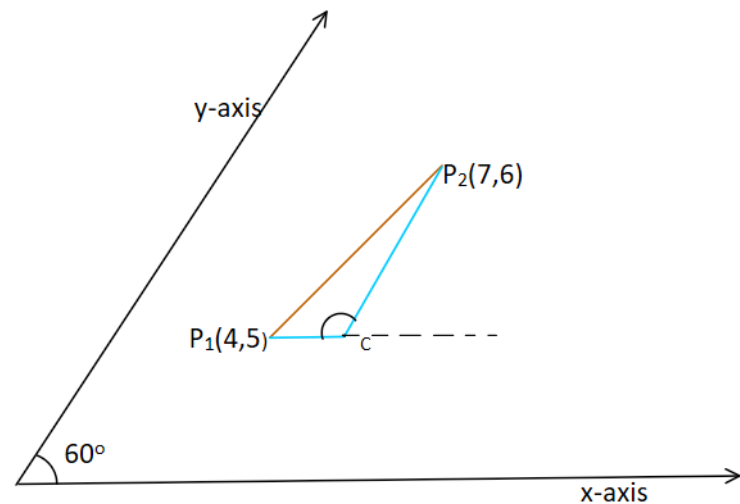   Assignment1.tex

Fig.Distance between P_1P_2