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Assignment 1

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Download all python codes from

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https://github.com/neharani289/ee14014/
Assignment1/codes

and latex-tikz codes from

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Assignment1

Q no. 46. what are the points on the y-axis whose distance from the line (4 3)x = 12 is 4 units.

Solution:

Here ,direction vectors of the lines are $\begin{pmatrix} 3 \\ -4 \end{pmatrix}$

normal vector n is given by,

$$n = \begin{pmatrix} 4 \\ 3 \end{pmatrix} \quad (0.0.1)$$

Using the formula for the distance of a point P from a line

$$d = \frac{|n^T P - c|}{\|\mathbf{n}\|} \quad (0.0.2)$$

Since the point lies on the y-axis. let

$$P = \begin{pmatrix} 0 \\ k \end{pmatrix} \quad (0.0.3)$$

the equation of the line is :

$$n^T x = c \quad (0.0.4)$$

$$\implies \frac{|n^T P - c|}{\|\mathbf{n}\|} = 4 \quad (0.0.5)$$

$$\implies 3k - 12 = \pm 20 \quad (0.0.6)$$

$$\implies k = -8 \ or \ 32/3 \quad (0.0.7)$$

therefore points on y-axis at distance of P from line are (0,-8) and (0,32/3).