AI1110 Assignment 1

Dasari Srinith (cs21btech11015)

29 March, 2022

Paper 2018

Q4 (b)

If the straight lines $3x - 5y = 7$ and $4x + ay + 9 = 0$ are perpendicular to one another , find the value of a.

Solution

Given,
The pair of lines $3x - 5y = 7$ and $4x + ay + 9 = 0$ are perpendicular to one another.
Slope of any line of form $ax + by + c = 0$ is $\frac{-a}{b}$
$\Rightarrow$Slope of line $3x - 5y = 7 = \frac{3}{5}$
$\Rightarrow$Slope of line $4x + ay + 9 = 0 = \frac{-4}{a}$
Since the two lines are perpendicular the product of their slopes should be -1.
So,

$$\frac{3}{5}.\frac{-4}{a} = -1$$

$\Rightarrow 5a = 12$
$\Rightarrow a = \frac{12}{5}$
So,

The value of a such that the given two lines are perpendicular is: $\frac{12}{5}$ or 2.4