Assignment-1

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March 30, 2022

4b[ICSE 2018]

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

Solution

If two lines are perpendicular, then dot product of their direction ratios is 0.

Vector form of 3x - 5y =7 is $\mathbf{r1} = \binom{4}{1} + t1\binom{5}{3}$, with $\binom{5}{3}$ as direction ratio.

Vector form of 4x+ay+9=0 is $\mathbf{r2} = \binom{\frac{-9}{4}}{0} + t2\binom{a}{-4}$, with $\binom{a}{-4}$ as direction ratio.

As $\binom{5}{3}.\binom{a}{-4} = 0$

5a - 12 = 0

So $a = (\frac{12}{5})$