For $\theta \in \left(0, \frac{\pi}{2}\right)$, all lines represented by the equation $(2\cos\theta + 3\sin\theta)x + (3\cos\theta - 5\sin\theta)y - (5\cos\theta - 2\sin\theta) = 0$,

(A) pass through (-1, 1)
(B) pass through a fixed point
(C) pass through a fixed point only for specific values of θ
(D) do not pass through a fixed point

Select correct option(s).

Solution

We have, $(2x+3y-5)\cos\theta + (3x-5y+2)\sin\theta = 0$

 $\therefore (2x+3y-5) + \tan\theta(3x-5y+2) = 0\{\because \cos\theta \neq 0\}$

The above family of lines passes through the point of intersection of lines 2x + 3y - 5 = 0 & 3x - 5y + 2 = 0.

Solving the above two equations, the point of intersection $\equiv (1,1)$

Answer: (B)