

Q1) find sum of x -coordinates of all the points on the line $x+y=4$ that lie at a unit distance from the line $4x+3y-10=0$

Sol let any arbitrary point on $x+y=4$ be $(t, 4-t)$

∴ dist of $(t, 4-t)$ from $4x+3y-10$ is

$$\Rightarrow \left| \frac{4t + 3(4-t) - 10}{\sqrt{4^2 + 3^2}} \right| = 1$$

$$|t + 2| = \sqrt{25}$$

$$t^2 + 4t - 21 = 0$$

$$t_1 + t_2 = \boxed{-4} \text{ (sum of roots)}$$

Ans.