

Q4. Let the algebraic sum of the perpendicular distances from the points $(2, 0)$, $(0, 2)$ and $(1, 1)$ to a variable straight line be zero; then the line passes through a fixed point whose coordinates are

[1991 - 2 Marks]

Sol 4. Let the variable line be $ax + by + c = 0$ (i)

$$\therefore \text{perpendicular distance of line from } (2, 0) = \frac{2a + c}{\sqrt{a^2 + b^2}}$$

$$\text{Perpendicular distance of line from } (0, 2) = \frac{2b + c}{\sqrt{a^2 + b^2}}$$

$$\text{Perpendicular distance of line from } (1, 1) = \frac{a + b + c}{\sqrt{a^2 + b^2}}$$

$$\text{Now, } \frac{2a+c}{\sqrt{a^2+b^2}} + \frac{2b+c}{\sqrt{a^2+b^2}} + \frac{a+b+c}{\sqrt{a^2+b^2}} = 0$$

$$\Rightarrow \frac{2a+c+2b+c+a+b+c}{\sqrt{a^2+b^2}} = 0$$

$$\Rightarrow a+b+c=0 \quad \dots\dots \text{(ii)}$$

From (i) and (ii), we can say variable line (i) passes through the fixed point (1, 1).