

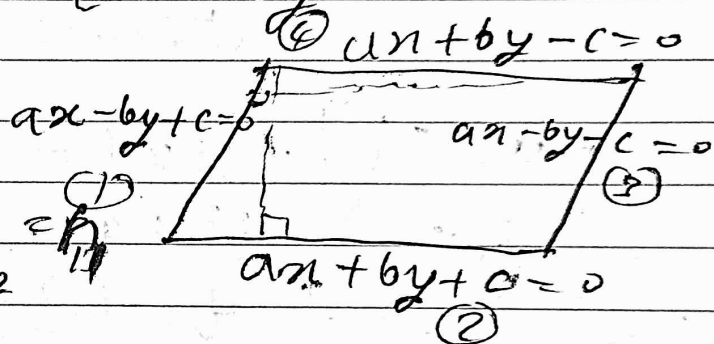
7] Prove that the lines form a rhombus.

$$\begin{cases} ax+by+c=0 \\ ax-by+c=0 \\ ax+by-c=0 \\ ax-by-c=0 \end{cases}$$

soln

∴ distance between (1) & (3)

$$\text{is } \left| \frac{c - (-c)}{\sqrt{a^2 + b^2}} \right| = \frac{2|c|}{\sqrt{a^2 + b^2}} = h_1$$



∴ distance between (2) & (4)

$$\text{is } \left| \frac{c - (-c)}{\sqrt{a^2 + b^2}} \right| = \frac{2|c|}{\sqrt{a^2 + b^2}} = h_2$$

∴ (area of ~~rhombus~~ ^{llgm}) = base × height

$$\Rightarrow h_1 = h_2$$

$$\Delta = b_1 h_1 = b_2 h_2$$

since $h_1 = h_2$, we get

$$b_1 = b_2 \quad \left[\begin{array}{l} \Rightarrow b_2 b_3 = b_4 b_1 \\ \text{since opp sides} \\ \text{are equal} \end{array} \right]$$

Hence All sides are equal &
∴ llgm is a RHOMBUS H.P.