

ASSIGNMENT1

Gaurav Kumar Gautam-sm21mtech12013

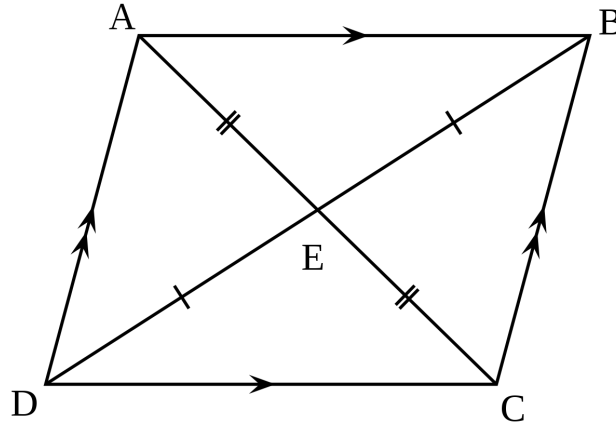
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Chapter II, Examples II

Question22(iv):- Find the condition that the four points $(x_1, y_1), (x_2, y_2), (x_3, y_3), (x_4, y_4)$ may be the vertices of a parallelogram.

Sol:- (i) Midpoints of diagonals of parallelogram are equal.

(ii) Opposite sides of parallelogram will be equal and parallel.



the above diagram AC and BD are diagonals.

Mid point of diagonals will be equal.

$$\frac{(\vec{x}_1 + \vec{x}_3)}{2}, \frac{(\vec{y}_1 + \vec{y}_3)}{2} = \frac{(\vec{x}_2 + \vec{x}_4)}{2}, \frac{(\vec{y}_2 + \vec{y}_4)}{2}$$

Opposite side AB and CD or AD and BC will be equal.

$$\sqrt{(\vec{x}_2 - \vec{x}_1)^2 + (\vec{y}_2 - \vec{y}_1)^2} = \sqrt{(\vec{x}_4 - \vec{x}_3)^2 + (\vec{y}_4 - \vec{y}_3)^2}$$

$$\sqrt{(\vec{x}_4 - \vec{x}_1)^2 + (\vec{y}_4 - \vec{y}_1)^2} = \sqrt{(\vec{x}_3 - \vec{x}_2)^2 + (\vec{y}_3 - \vec{y}_2)^2}$$

If all these condition of any vertices follows then we can say this vertices is for parallelogram.