ACTIVITY

Parallelogram

Objective

To obtain a parallelogram by paper folding, whose adjacent sides are given.

Material Required

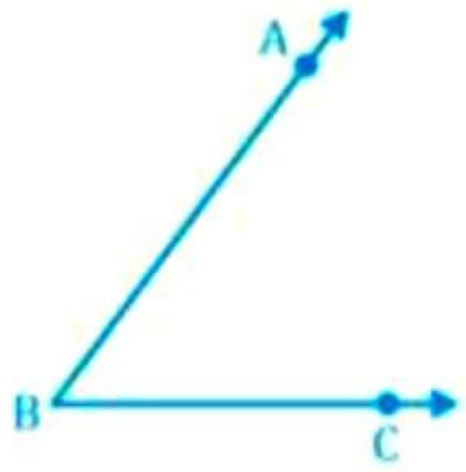
Glazed papers, pen, pencil, scale.

Theory

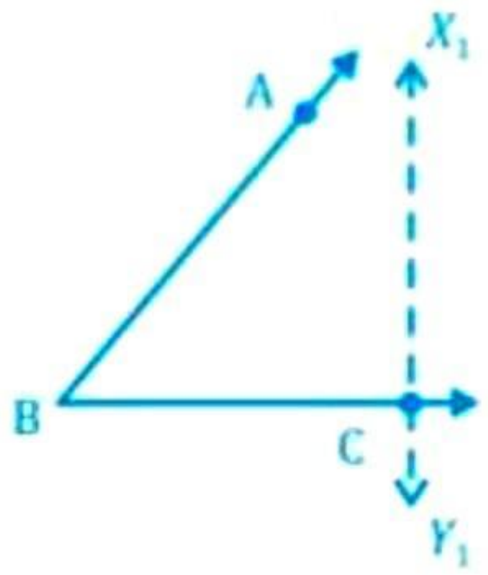
1. A parallelogram is a quadrilateral in which the pairs of opposite sides are equal and parallel.
2. Basic properties of a parallelogram.

Procedure

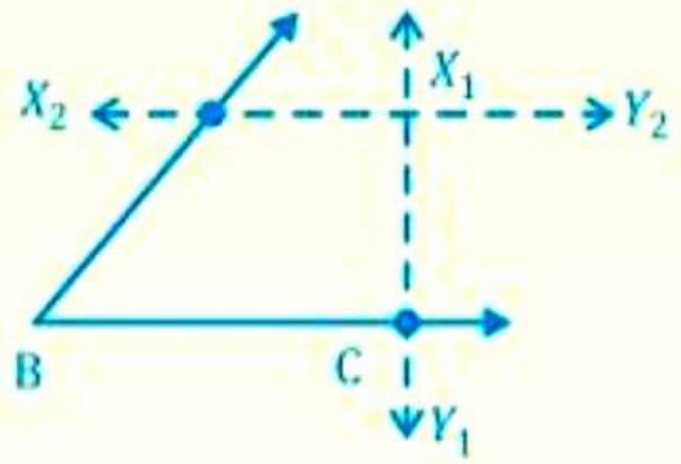
1. Take a sheet of glazed paper. Draw any two intersecting rays AB and BC such that they form an acute angle which will be the two adjacent sides of a parallelogram.



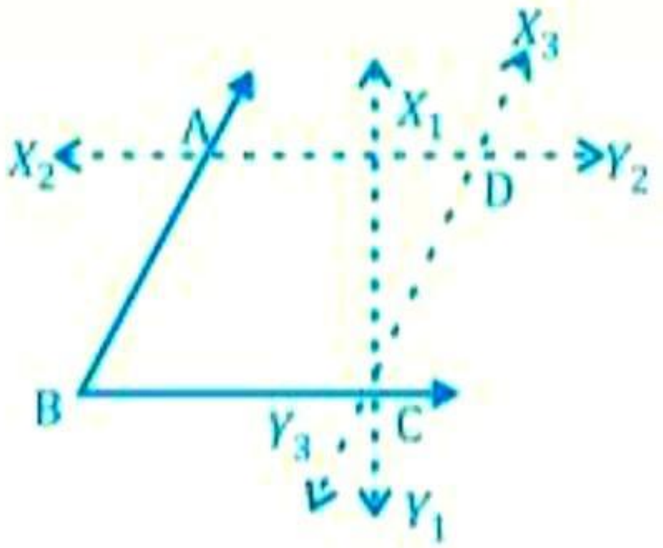
2. Fold the paper along a line that cuts the line BC, the part of line BC that lies on one side of the line of fold falls on the other part. Make a crease, such that $X_1Y_1 \perp BC$ and unfold the paper.



3. Fold the paper such that line passes through point A and is parallel to BC. Make a crease and unfold the paper. Draw the dotted line X_2Y_2.



4. **Fold the paper along the line that passes through the point C which is parallel to line AB and cuts the line X_2Y_2. Make a crease and unfold it. Draw the line parallel to AB. Mark the intersecting point of X_2Y_2 and X_3Y_3 as D.**



Observation

Since AD is parallel to BC and DC is parallel to AB, ABCD is the required parallelogram

Result

ABCD is the required parallelogram having AB and BC as its two adjacent sides.

Learning Outcome

Without using protector and scale, we can construct a parallelogram by paper folding of any measurement.

Activity Time

Students may construct a parallelogram of sides 4cm and 6cm with different angles.

Viva Voce

Q1. What is the relationship between the areas of the parallelograms on the same base (or equal bases) and between the same parallel lines?

Ans: Both areas are same.

Q2. What are the types of parallelograms?

Ans: Parallelograms are of three types, i.e., rectangle, square, and rhombus.

Q3. How would you define the area of a parallelogram?

Ans: The area of a parallelogram is the product of its base and the corresponding altitude.

Q4. What is the altitude of a parallelogram?

Ans: Altitude of a parallelogram is the perpendicular distance between two parallel sides.

Q5. Is it correct that the diagonals of a parallelogram bisect the angles?

Ans: Yes.

Q6. Is it correct that every square and rhombus are parallelograms?

Ans: Yes, because opposite sides of their figures are parallel and equal.

Q7. In which quadrilateral figure diagonals are not equal other than parallelogram?

Ans: Rhombus.

Q8. Do the diagonals of a parallelogram divide it into two triangles of equal base?

Ans: No, the diagonals of a parallelogram divide it into four triangles of equal base.

Multiple Choice Questions

Q 1. The quadrilateral formed by joining the mid-points of the sides of a quadrilateral PQRS taken in order is a rhombus, if:

(a) PQRS is a rhombus. (b) PQRS is a parallelogram.

(c) Diagonals of PQRS are perpendicular. (d) Diagonals of PQRS are equal.

Q 2. If Diagonals AC and BD of a quadrilateral ABCD intersect at O in such a way that ar(△ AOD) = ar(△ BOC). Then ABCD is a:

(a) Parallelogram (b) Rectangle (c) Square (d) Trapezium

Q 3. The figure obtained by joining the mid-points of the sides of a rhombus taken in order is:

(a) A rhombus (b) A rectangle (c) A square (d) Any parallelogram

Q 4. In a trapezium ABCD with AB ∥ CD and AD = BC, if ∠D = 70°, then ∠C will be of:

(a) 70° (b) 110° (c) 20° (d) None of these

Q 5. Points D and E are the mid-points of sides AB and AC of a △ ABC. If the length of line segment DE = 6. 5 cm, then length of side BC is equal to:

(a) 6.5 cm (b) 26 cm (c) 13 cm (d) 5.5 cm

Q 6. The ratio of the line segment joining the mid-points of any two sides of a triangle and the third side is given by:

(a) 2: 1 (b) 1: 2 (c) 1: 1 (d) 2: 3

Q 7. D and E are the mid-points of the sides AB and AC respectively of △ ABC and O is any point on side BC. O is joined to A. If P and Q are the mid-points of OB and OC respectively, then DEQP is:

(a) a square (b) a rectangle (c) a rhombus (d) a parallelogram

Q 8. The area of the figure formed by joining the mid-points of the adjacent sides of a rhombus with diagonals 12 cm and 16 cm is:

(a) 48 cm^2 (b) 96 cm^2 (c) 64 cm^2 (d) 192 cm^2

Q 9. Find the perimeter of parallelogram if AB = CD = 10cm, AD = BC = 25:

(a) 85 cm (b) 75 cm (c) 70 cm (d) 65 cm

ANSWER KEY

1.(d)	2.(d)	3.(b)	4.(a)	5.(c)	6.(b)	7.(d)	8.(a)	9.(c)