Verify Exterior Angle Property Of a Triangle

OBJECTIVE

To verify exterior angle property of a triangle.

Materials Required

1. Cardboard sheet
2. Adhesive
3. Glazed papers
4. White chart paper
5. Geometry box
6. Tracing paper
7. Cutter

Prerequisite Knowledge

1. Straight angle
2. Exterior angle property of a triangle.

Theory

1. For straight line refer to Activity 11.
2. For exterior angle property of a triangle refer to Activity 12.

Procedure

1. Take a cardboard sheet of suitable size and by using adhesive, paste a white chart paper on it.
2. Cut out a ΔABC from a glazed paper and paste it on the cardboard, (see Fig. 13.1)

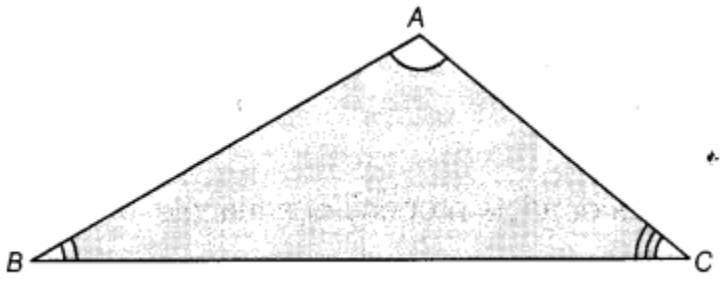

Fig. 13.1

3. Now, produce the side BC of ΔABC to the point D. (see Fig. 13.2)

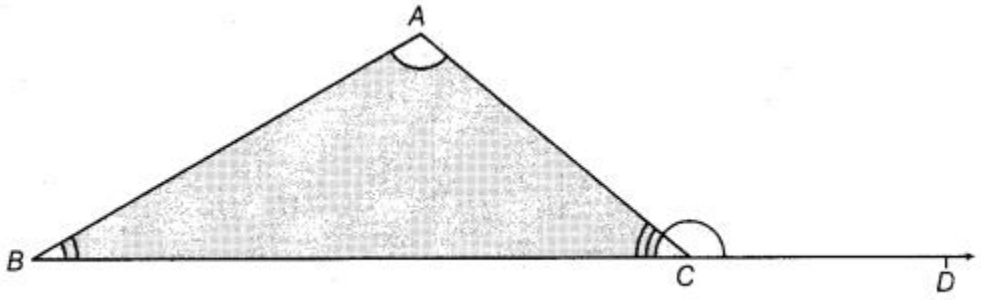

Fig. 13.2

4. Cut out the pair of angles, ∠A and ∠B from the glazed paper by using a tracing paper, (see Fig. 13.3).

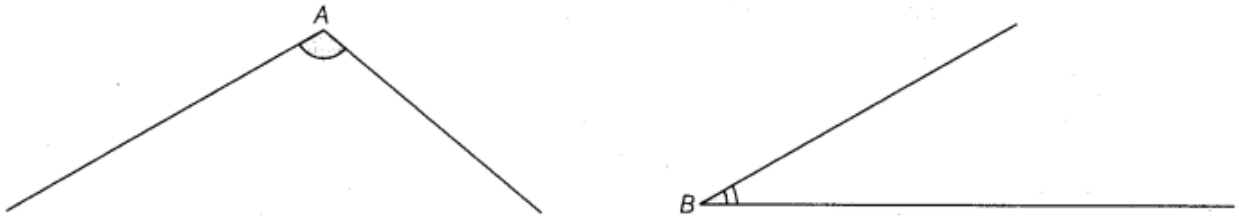

Fig. 13.3

5. Now, arrange the cut out angles as shown in Fig. 13.4.

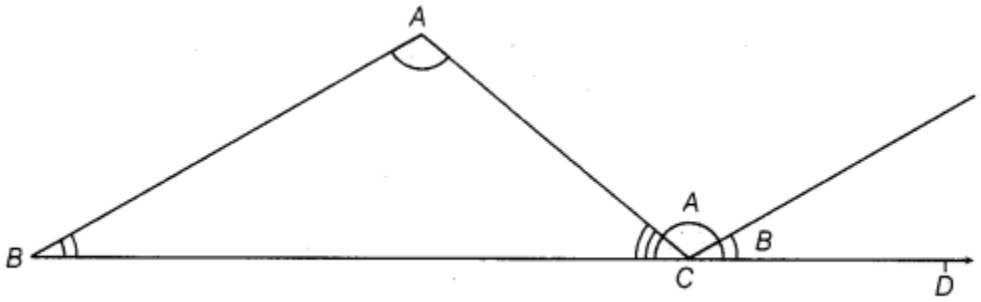

Fig. 13.4

Demonstration

From Fig. 13.4,

1. ∠ACD is an exterior angle.
2. ∠A and ∠B are its two interior opposite angles.
3. The two cut out angles, ∠A and ∠B together completely cover ∠ACD. So, ∠ACD = ∠A + ∠B.

Observation

Measure of ∠A = …… , and ∠B = …… ,
Sum of (∠A + ∠B) = …… , and measure of ∠ACD = …… ,
Therefore, ∠ACD = ∠A + ∠B.

Result

We have verified the exterior angle property of a triangle.

Application

Many geometrical problems may be easily done, using this property of a triangle.

Viva Voce

Question 1:
What do you mean by the linear pair axiom?
Answer:
If a ray stands on a line, then the sum of the two adjacent angles so formed is 180° and vice-versa. This property is known as linear pair axiom.

Question 2:
What would be the measure of exterior angle for each vertex of equilateral triangle?
Answer:
120° (=60°+ 60°).

Question 3:
Does an exterior angle of a triangle is smaller than either of its interior opposite angles?
Answer:
No, an exterior angle of a triangle is greater than either of its opposite interior angles.

Question 4:
If the exterior angle of a triangle is 90°, then what would be the opposite interior angles, supplementary or complementary?
Answer:
Complementary.

Question 5:
How would you define an exterior angle property of a triangle?
Answer:
An exterior angle of a triangle is equal to sum of opposite interior angles.

Question 6:
If the sum of interior opposite angles of a triangle is 130°, then what would be the measure of its exterior angle?

Answer:
Sum of interior opposite angles = Exterior angle Exterior angle = 130°.

Question 7:
What is the angle form by straight line?
Answer:
The straight line always form a angle of 180°.

Question 8:
What is the condition of exterior angle of a triangle?
Answer:
The exterior angle of a triangle is equal to the sum of opposite interior angles.

Question 9:
What is the sum of exterior angles of a triangle?
Answer:
We know that the sum of exterior angles of a polygon is always 360°. The sum of exterior angles of a triangle is 360°.

Suggested Activity

To verify that the exterior angle of a triangle is greater than either of its opposite interior angles.