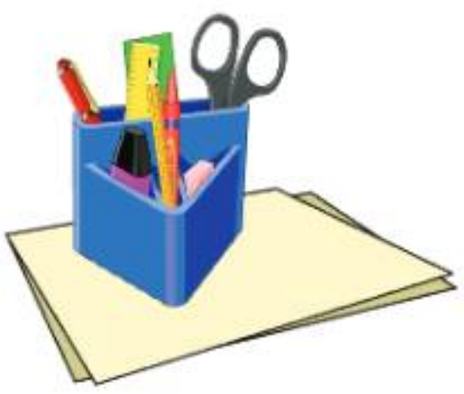
Activity 71



Objective

To draw regular polygons, using circles

Material Required

Coloured paper, scissors, geometry box.

Method of Construction

1. Draw three circles of the same radii on a coloured paper.

2. Take one of the circles and draw three angles each of 120° $(=\frac{360°}{3})$ at the centre as shown in Fig.1.

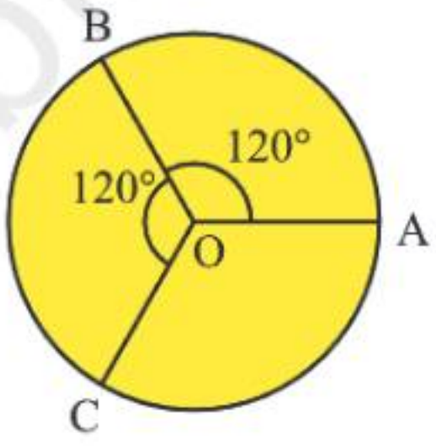


Fig. 1

3. Take second circle and draw four angles each of 90° $(=\frac{360°}{4})$ at the centre as shown in Fig. 2.

4. On the third circle, draw five angles each of 72° $(=\frac{360°}{5})$ at the centre as shown in Fig. 3.

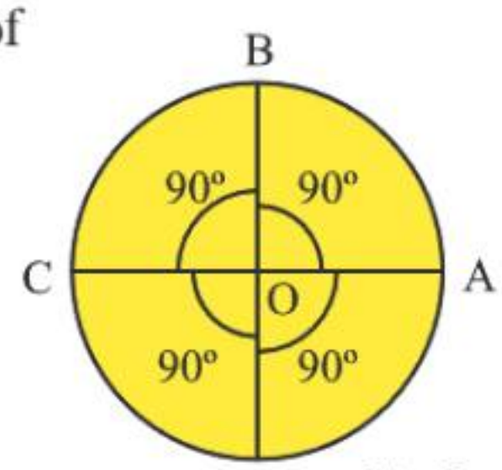


Fig. 2

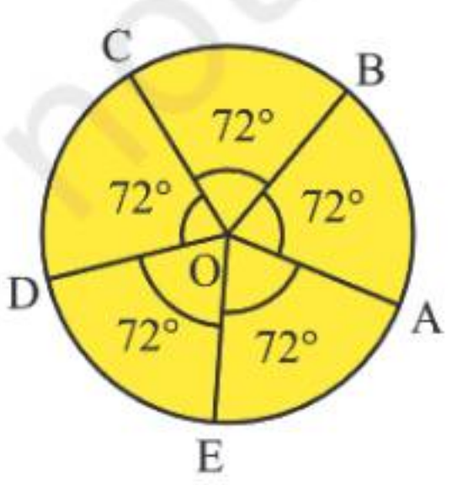


Fig. 3

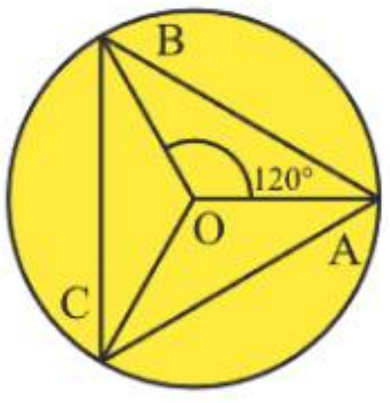


Fig. 4

DEMONSTRATION

1. In Fig.1, join AB, BC and CA as shown in Fig. 4. ABC is a regular polygon of sides three (an equilateral triangle).

2. In Fig. 2, join AB, BC, CD and DA as shown in Fig. 5. ABCD is a regular polygon of sides four (a square).

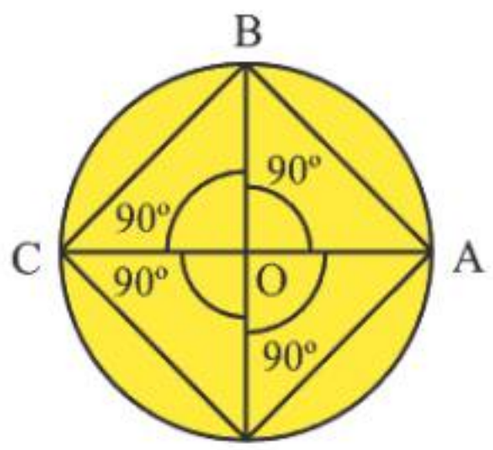


Fig. 5

3. In Fig. 3, join AB, BC, CD, DE and EA as shown in Fig. 6.

   ABCD is a regular polygon of sides five.

Similarly, regular polygons of sides six, eight, nine and ten sides can be drawn.

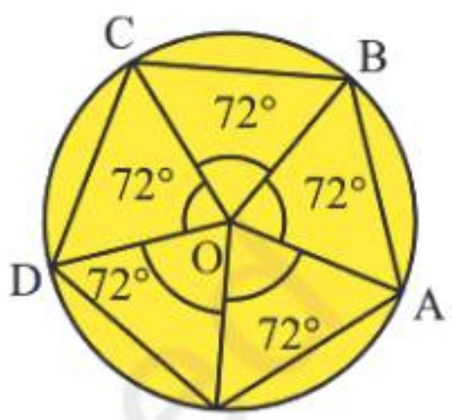


Fig. 6

OBSERVATION

On actual measurement:

S. No.	Name of sides	Length of sides (cm)
Figure 4	Equilateral Δ AB = ____, ∠A = ____. BC = ____, ∠B = ____. AC = ____, ∠C = ____.	— — — —
Figure 5	AB = ____, ∠A = ____. BC = ____, ∠B = ____. CD = ____, ∠C = ____. AD = ____, ∠D = ____.	— — — —
Figure 6	AB = ____, ∠A = ____. BC = ____, ∠B = ____. CD = ____, ∠C = ____. DE = ____, ∠D = ____. AE = ____, ∠E = ____.	— — — — —

In Fig. 4 all the three sides are ____ and all the three angles are ____.

So, ABC is a regular polygon of sides ____.

In Fig. 5, all the four sides are _____and all the four angles are_____.

So, ABCD is a regular polygon of sides _____.

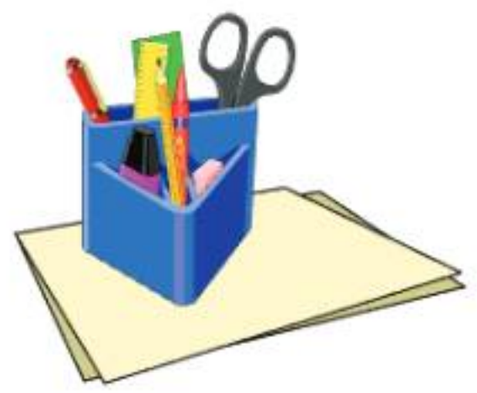
In Fig. 6, all the five sides are _____ and all the five angles are _____.

So, ABCDE is a polygon of sides_____.

Application

This activity is useful in explaining the meaning of a regular polygon and how to draw a regular polygon.

Activity 72



Objective

To make a kite by paper folding and cutting

Material Required

Thick paper, cardboard, pen/pencil, ruler, scissors, adhesive.

Method of Construction

1. Take a rectangular thick white paper.
2. Fold it once as shown in Fig. 1.

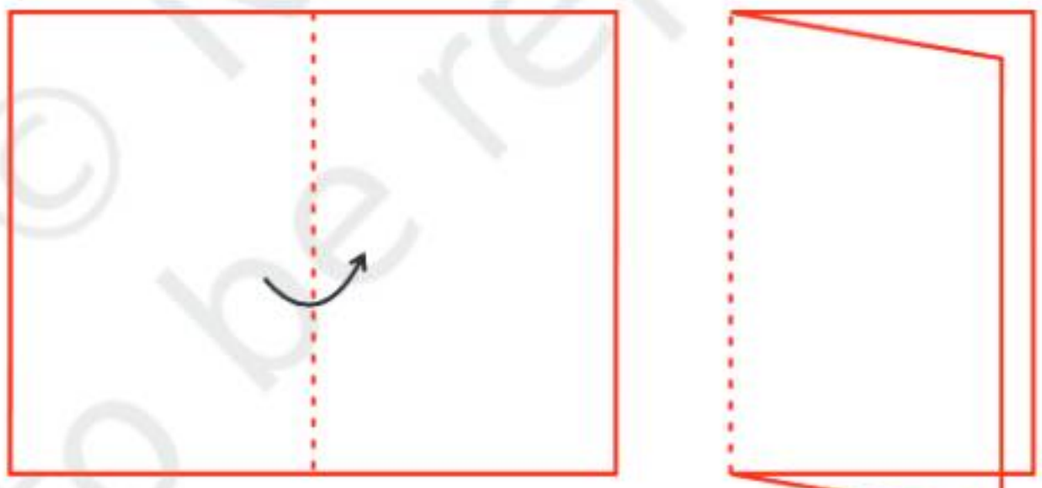
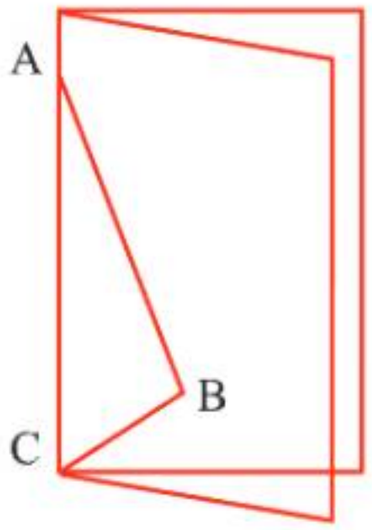


Fig. 1

3. Draw two line segments of different lengths as shown in Fig. 2.

Fig. 2



4. Cut along AB and BC and unfold it to get a figure as shown in Fig. 3. Paste the cut out on a cardboard.

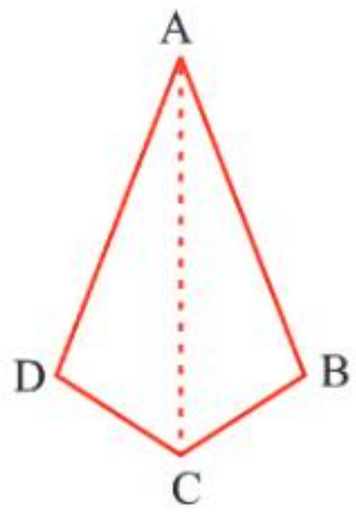


Fig. 3

DEMONSTRATION

1. AB is equal to AD as AB covers AD exactly in Fig. 2.
2. BC is equal to DC as BC covers DC exactly in Fig. 2.
3. So, ABCD is a kite.

OBSERVATION

On actual measurement:

AB = _____. AD = _____.

BC = _____. DC = _____.

Measure of ∠DAC = _____.

∠BAC = _____.

∠DCA = _____. ∠BCA = _____.

∠DAC = ∠ _____.

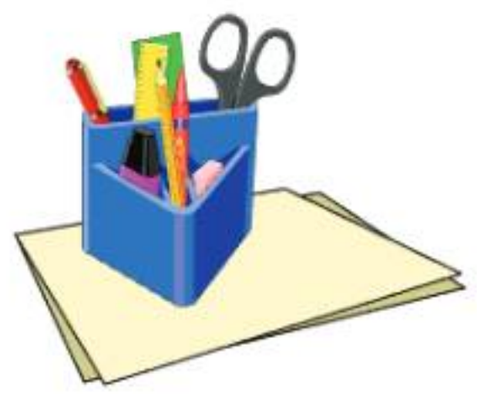
∠DCA = ∠ _____.

So, ABCD is a _____.

APPLICATION

This activity will help in understanding the shape of a kite and all its properties.

Activity 73



Objective

To verify that the sum of four angles of a quadrilateral is 360°

Material Required

Cardboard, coloured glaze paper, colours, ruler, pencil, drawing sheet, scissors, tracing paper.

Method of Construction

1. Take a cardboard of convenient size and cover it with a light coloured glaze paper.
2. Take a drawing sheet and draw a quadrilateral on it.
3. Cut it out and paste it on the cardboard. Name it as ABCD (Fig. 1).

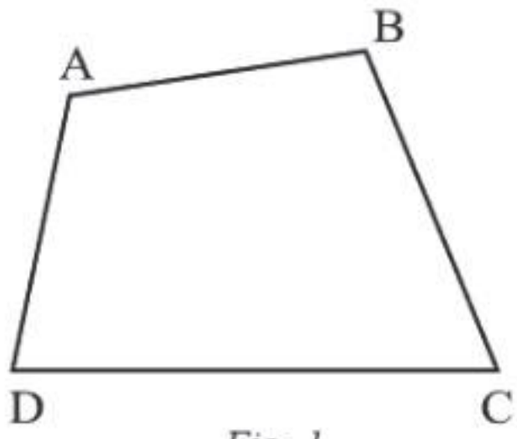


Fig. 1

Make a trace copy of the quadrilateral ABCD.

4. Colour the four angles with different colours in both the quadrilaterals (Fig. 2).

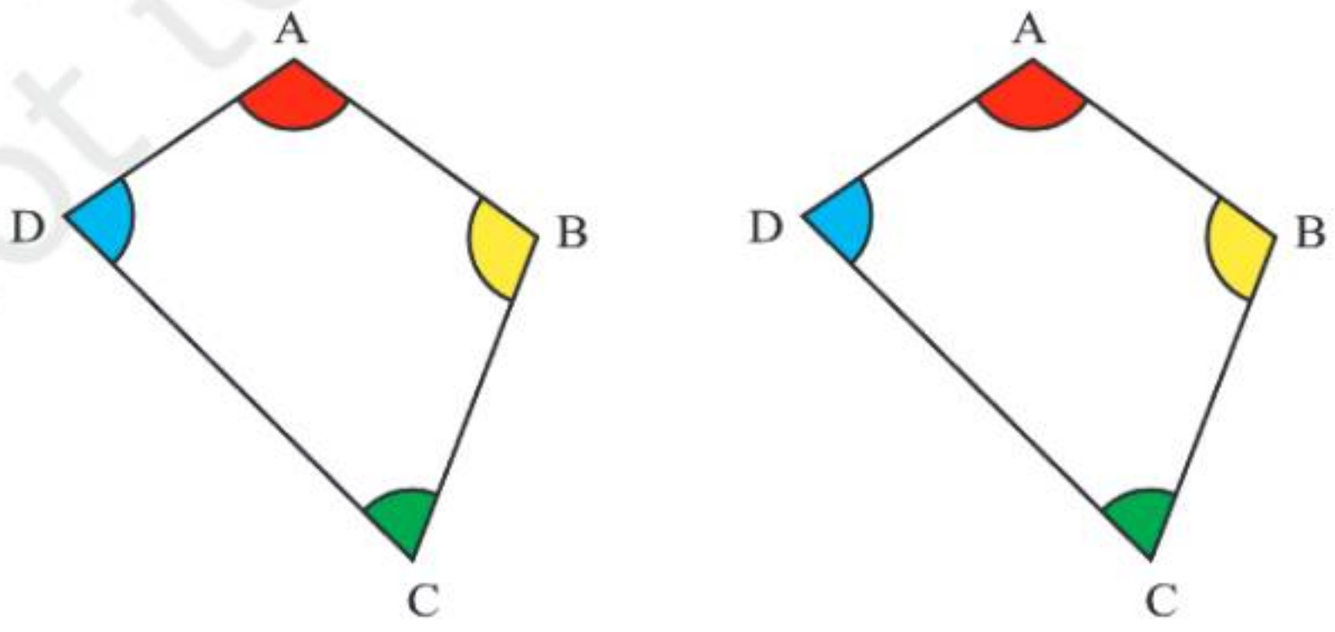


Fig. 2

5. Cut out the angles A, B, C and D from the trace copy and arrange them on the cardboard at a point P so that there is no gap between adjacent angles as shown in Fig. 3.

DEMONSTRATION

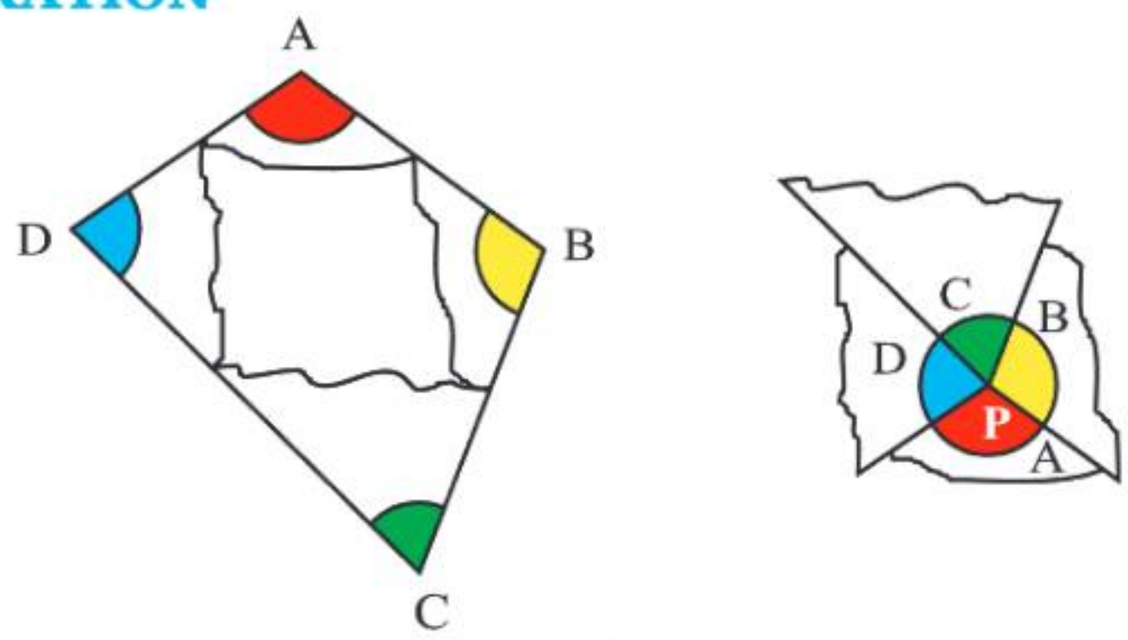


Fig. 3

1. The four angles A, B, C and D make a complete angle at the point P.
2. Sum of angles at point P is 360°.

   So, $\angle A + \angle B + \angle C + \angle D = 360°$.

OBSERVATION

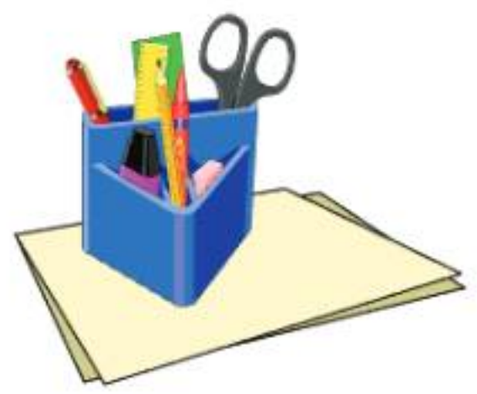
On actual measurement:

Angle	**Measure**
$\angle A$	____
$\angle B$	____
$\angle C$	____
$\angle D$	____
$\angle A + \angle B + \angle C + \angle D$	____

APPLICATION

This activity can be used in solving many geometrical problems.

Activity 74



Objective

To verify that sum of exterior angles of a triangle and quadrilateral taken in order is 360° or four right angles

Material Required

Cardboard, white drawing sheet, colours, pencil, ruler, scissors, tracing paper.

Method of Construction

(A) Triangle

1. Take a cardboard of convenient size and paste a coloured glaze paper on it.

2. Draw a triangle ABC on a drawing sheet and produce its sides in an order as shown in Fig.1.

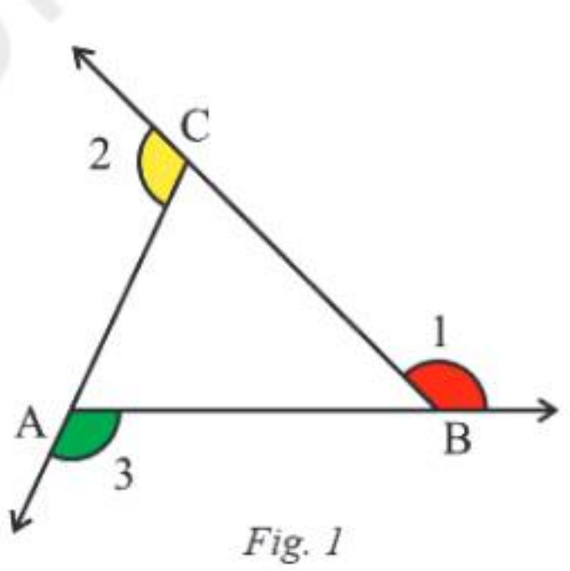


Fig. 1

3. Name the exterior angles as 1, 2 and 3 and colour them as shown above in Fig.1.

4. Make a trace copy of the above figure and colour the exterior angles with the same colours as in Fig. 1.

5. Cut out the exterior angles neatly.

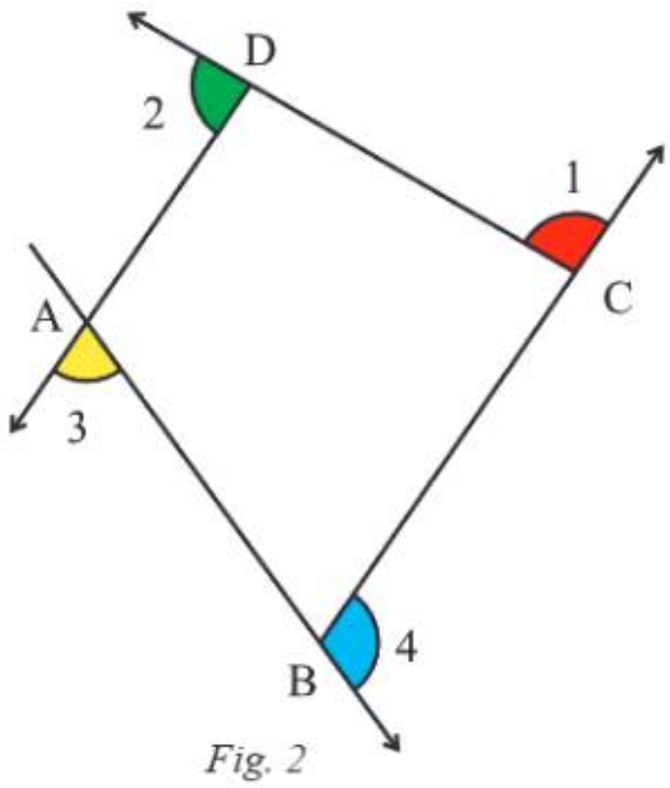


Fig. 2

(B) Quadrilateral

1. Draw a quadrilateral ABCD on a drawing sheet and produce its sides in an order as shown in Fig. 2.

2. Name the exterior angles as 1, 2, 3 and 4 and colour them as shown in Fig. 2.

3. Make the trace copy of the above figure and colour the exterior angles with the same colours as in Fig. 2.

4. Cut out the exterior angles neatly.

Demonstration

(A)

1. Place the cutouts of the exterior angles of Fig.1 adjacent to each other at a point P without having any gap between any two consecutive angles as shown in Fig. 3.

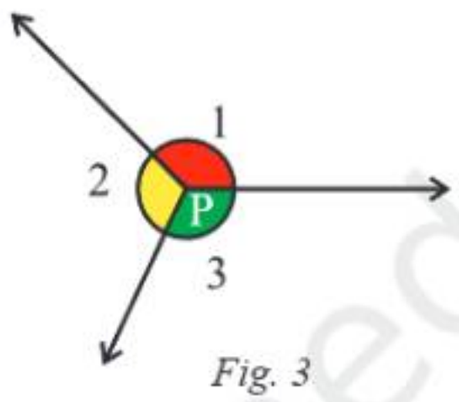


Fig. 3

(B)

2. Place the cutouts of the exterior angles of Fig. 2 adjacent to each other at a point Q without having any gap between any two consecutive angles as shown in Fig. 4.

3. The exterior angles in Fig. 3 as well as in Fig. 4 make a complete angle at the points P and Q respectively.

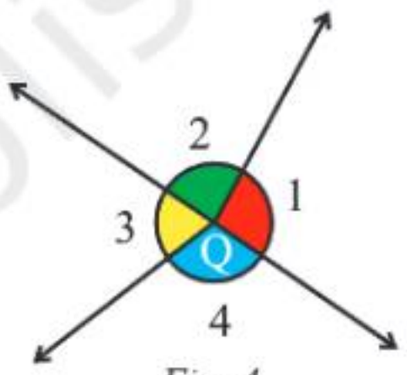


Fig. 4

4. The sum of angles at a point is 360°.

   So, $\angle 1 + \angle 2 + \angle 3 = 360°$. for (A)

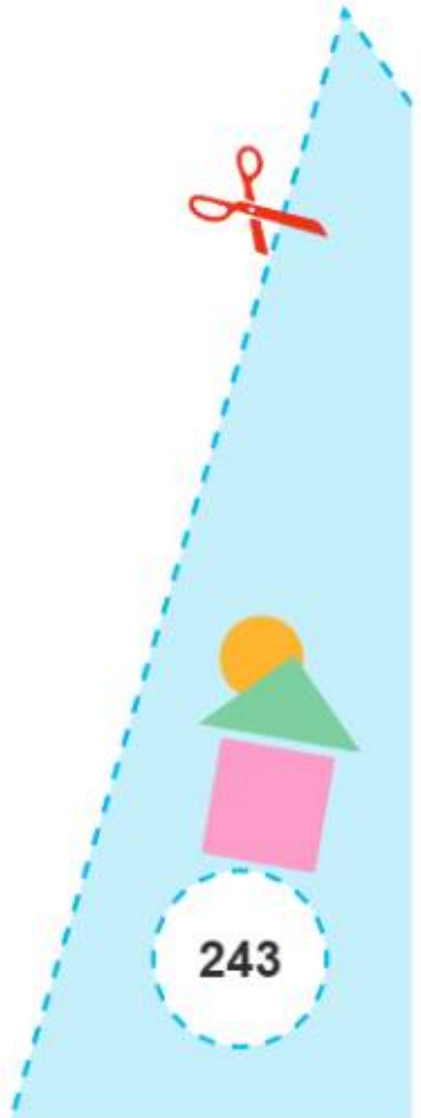
   and $\angle 1 + \angle 2 + \angle 3 + \angle 4 = 360°$ for (B)

Observation

On actual measurement:

(A) Triangle

Angle		Measure
$\angle 1$		___
$\angle 2$		___
$\angle 3$		___
$\angle 1 + \angle 2 + \angle 3$	=	___.



(B) Quadrilateral

Angle	Measure
$\angle 1$	___
$\angle 2$	___
$\angle 3$	___
$\angle 4$	___

$\angle 1 + \angle 2 + \angle 3 + \angle 4 =$ ___.

APPLICATION

This activity can be used to find the sum of exterior angles produced in order, of a pentagon, a hexagon or in general any polygon.