

TRIANGLES

Activity – 6(ii)

1. What we have to do?

To verify 'the ratio of the areas of two similar triangles is equal to the ratio of the squares of their corresponding sides'.

2. What is required?

Chart papers, Geometry box, Pencil colours, pair of scissors, glue stick

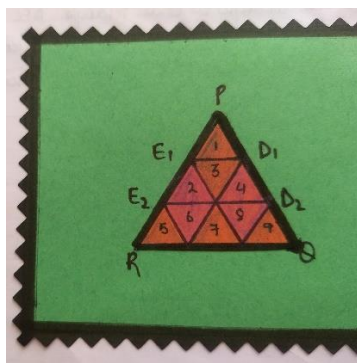
3. Time required: 30 min

4. What do we need to know?

Concept of parallel lines, Division of a line in the given ratio

5. How will you proceed?

- 1) Take a Chart paper and cut an Equilateral triangle ABC with side 6 cm.
- 2) Mark 5 points P_1, P_2, P_3, P_4 and P_5 at a distance of 1 cm each on the side AB and Q_1, Q_2, Q_3, Q_4 and Q_5 at a distance of 1 cm each on the side AC of $\triangle ABC$.
- 3) Join $P_1Q_1, P_2Q_2, P_3Q_3, P_4Q_4$ and P_5Q_5 .
- 4) Draw lines parallel to AC from P_1, P_2, P_3, P_4, P_5 and also draw lines parallel to AB from the points Q_1, Q_2, Q_3, Q_4, Q_5 .
- 5) Hence $\triangle ABC$ is divided into 36 smaller triangles and all are similar to each other and of equal area.
- 6) Construct a $\triangle PQR$ with $PQ = \frac{1}{2} AB = BC = CA$ i.e. 3 cm each on another chart paper.
- 7) Mark D_1, D_2 and E_1, E_2 on the sides PQ and PR respectively.
- 8) Repeat steps 3) and 4) above.
- 9) Hence $\triangle PQR$ is divided into 9 smaller similar triangles equal in area.



6. What have you observed?

- 1) Area of $\triangle ABC$ = Area of _____ smaller $\triangle$ s
- 2) Area of $\triangle PQR$ = Area of _____ smaller $\triangle$ s
- 3) $\frac{PQ}{AB} = \frac{PR}{AC} = \frac{QR}{BC} = \frac{1}{2}$
- 4) $\frac{Ar(\triangle PQR)}{Ar(\triangle ABC)} = \left(\frac{PQ}{AB}\right)^2 = \frac{1}{4}$

7. What have you learnt?

From the above activity it is verified that _____

8. What would you be interested in doing?

Perform the above activity by taking two isosceles similar triangles $\triangle ABC$ with $AB = AC = 5$ cm and $BC = 6$ cm & $\triangle PQR$ with $PQ = PR = 10$ cm and $QR = 12$ cm. Hence verify this activity.

Real Life Applications:

The above concept is used in floorings, Tiling in building homes, offices and shopping malls, Architecture etc...
