

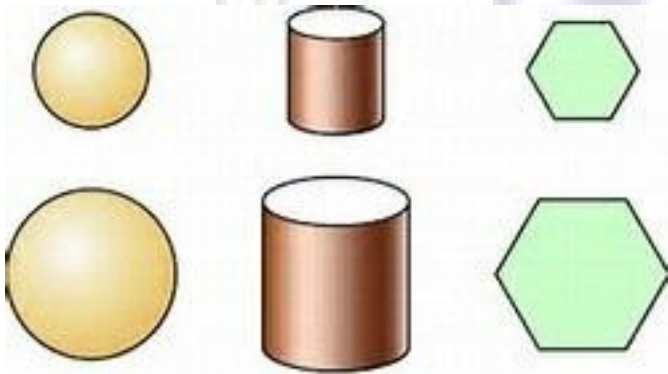


CHAPTER 06

TRIANGLES

1. Similar Figures
2. Similarity of Triangles
3. Criteria for Similarity of Triangles
4. Areas of Similar Triangles
5. Pythagoras Theorem
6. Miscellaneous Questions

1. **Similar Figures:** Similar figures have the same shape (but not necessarily the same size). In geometry, two squares are similar, two equilateral triangles are similar, two circles are similar and two line segments are similar.

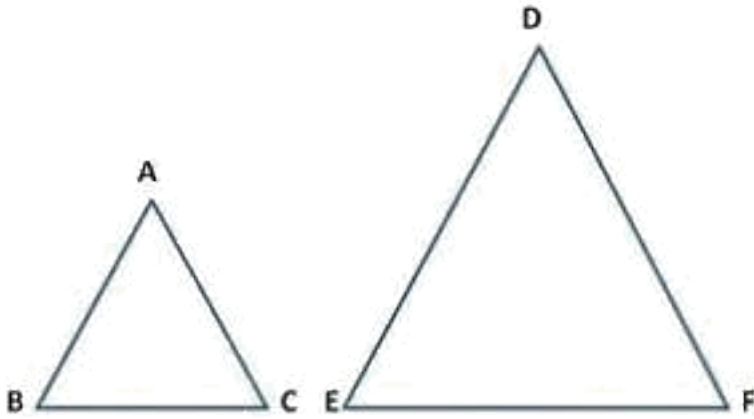


Similar Figures

2. **Similar Triangles:** Two triangles are said to be similar if their corresponding angles are equal and their corresponding sides are proportional.
3. **Equiangular Triangles:** Two triangles are equiangular if their corresponding angles are equal. The ratio of any two corresponding sides in two equiangular triangles is always the same.

4. Criteria for Similarity:

in and $\triangle ABC$ and $\triangle DEF$



(i) **AAA Similarity:** $\triangle ABC \sim \triangle DEF$ when $\angle A = \angle D$, $\angle B = \angle E$ and $\angle C = \angle F$

(ii) **SAS Similarity:** $\triangle ABC \sim \triangle DEF$, when $\angle A = \angle D$ or $\angle B = \angle E$ or $\angle C = \angle F$ and

$$\frac{AB}{DE} = \frac{AC}{DF} = \frac{BC}{EF}$$

(iii) **SSS Similarity:** $\triangle ABC \sim \triangle DEF$, when $\frac{AB}{DE} = \frac{AC}{DF} = \frac{BC}{EF}$

4. The proof of the following theorems can be asked in the examination:

(i) **Basic Proportionality Theorem:** If a line is drawn parallel to one side of a triangle to intersect the other sides in distinct points, the other two sides are divided in the same ratio.

(ii) **Converse of Basic Proportionality Theorem:** If in two triangles, the corresponding angles are equal, their corresponding sides are proportional and the triangles are similar.

(iii) If one angle of a triangle is equal to one angle of other triangle and the sides including these angles are proportional, the triangles are similar.

(iv) If a perpendicular drawn from the vertex of the right angle of a right triangle to the hypotenuse, the triangles on each side of the perpendicular are similar to the whole triangle and to each other.

(v) **Area Theorem:** The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides.

(iii) **Pythagoras Theorem:** In a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.

(iv) **Converse of Pythagoras Theorem:** In a triangle, if the square of one side is equal to the sum of the squares of the other two sides then the angle opposite to the first side is a right angle.