

# Key Notes

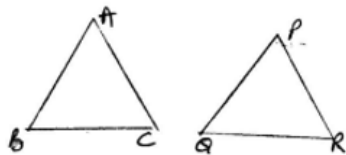
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## Chapter - 7

### Triangles

1. Congruence of Triangles
2. Criteria for Congruence of Triangles
3. Some Properties of a Triangle
4. Inequalities in a Triangle

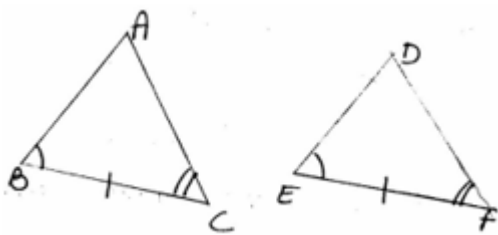
- **Triangle-** A closed figure formed by three intersecting lines is called a triangle. A triangle has three sides, three angles and three vertices.
- **Congruent figures-** Congruent means equal in all respects or figures whose shapes and sizes are both the same for example, two circles of the same radii are congruent. Also two squares of the same sides are congruent.
- **Congruent Triangles-** two triangles are congruent if and only if one of them can be made to superpose on the other, so as to cover it exactly.
- If two triangles ABC and PQR are congruent under the correspondence  $A \leftrightarrow P, B \leftrightarrow Q$  and  $C \leftrightarrow R$  then symbolically, it is expressed as  $\triangle ABC \cong \triangle PQR$



- In congruent triangles corresponding parts are equal and we write 'CPCT' for corresponding parts of congruent triangles.
- **SAS congruency rule -** Two triangles are congruent if two sides and the included angle of one triangle are equal to the two sides and the included angle of the other triangle. For example:  $\triangle ABC$  and  $\triangle PQR$  as shown in the figure satisfy SAS congruent criterion.



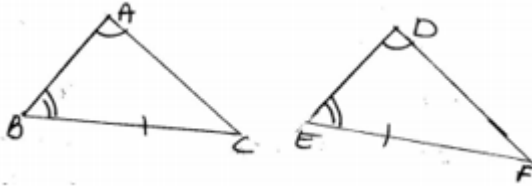
- **ASA Congruence Rule-** Two triangles are congruent if two angles and the included side of one triangle are equal to two angles and the included side of other triangle. For examples  $\triangle ABC$  and  $\triangle DEF$  shown below satisfy ASA congruence criterion.



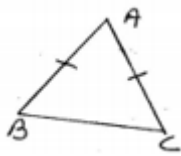
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- AAS Congruence Rule- Two triangles are congruent if any two pairs of angles and one pair of corresponding sides are equal for example  $\triangle ABC$  and  $\triangle DEF$  shown below satisfy AAS congruence criterion.



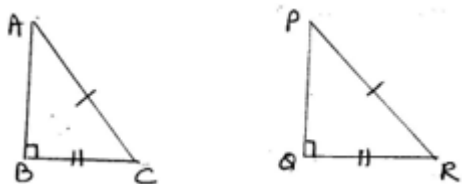
- AAS criterion for congruence of triangles is a particular case of ASA criterion.
- **Isosceles Triangle**- A triangle in which two sides are equal is called an isosceles triangle. For example:  $\triangle ABC$  shown below is an isosceles triangle with  $AB=AC$ .



- Angle opposite to equal sides of a triangle are equal.
- Sides opposite to equal angles of a triangle are equal.
- Each angle of an equilateral triangle is  $60^\circ$ .
- SSS congruence Rule - If three sides of one triangle are equal to the three sides of another triangle then the two triangles are congruent for example  $\triangle ABC$  and  $\triangle DEF$  as shown in the figure satisfy SSS congruence criterion.



- RHS Congruence Rule- If in two right triangles the hypotenuse and one side of one triangle are equal to the hypotenuse and one side of the other triangle then the two triangles are congruent. For example:  $\triangle ABC$  and  $\triangle PQR$  shown below satisfy RHS congruence criterion.



RHS stands for right angle - Hypotenuse side.

- A point equidistant from two given points lies on the perpendicular bisector of the line segment joining the two points and its converse.
  - A point equidistant from two intersecting lines lies on the bisectors of the angles formed by the two lines.
  - In a triangle, angle opposite to the longer side is larger (greater)
  - In a triangle, side opposite to the large (greater) angle is longer.
  - Sum of any two sides of a triangle is greater than the third side.
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