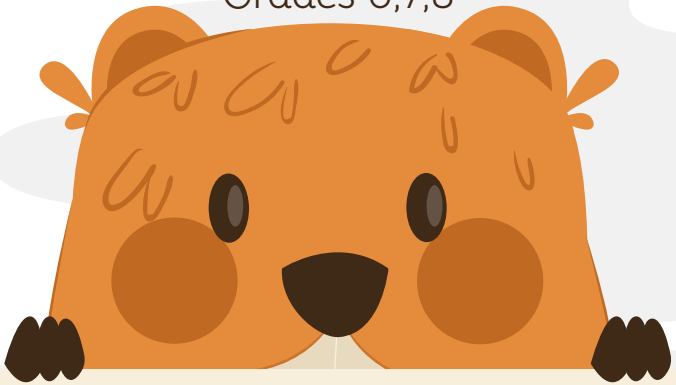
Types of Triangles & Congruences

The Philomath Club
Grades 6,7,8



Lesson 3-Congruence

In geometry, two figures are congruent if they have the same shape and size.

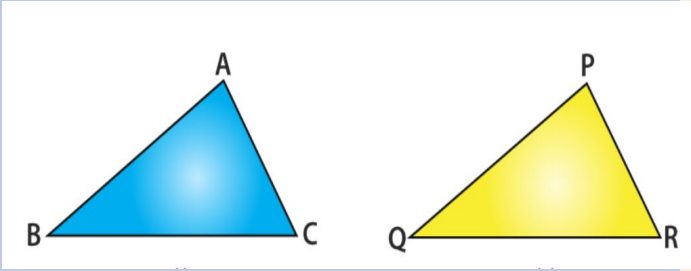
1. Two line segments are congruent if they have the same length.
2. Two angles are congruent if they have the same measure.
3. Two circles are congruent if they have the same diameter.

In this sense, two figures are congruent if their corresponding parts are equal.

Congruence in triangles

Both the triangles in the figure have the same size and shape and they are said to be congruent. We express it this way:

$$\Delta ABC \cong \Delta PQR$$



1. It is noted that, when you place a triangle PQR on triangle ABC, P falls on A, Q falls on B and R falls on C, also the side PQ falls alongside AB, QR falls along BC and PR falls along AC.
2. Under a correspondence property, when two triangles are congruent, then their corresponding sides and angles match with one another are it must be equal. So, in these two congruent triangles, we have the congruences as follows:

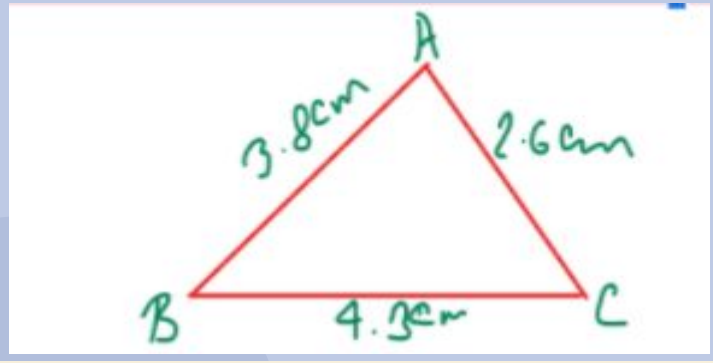
1. Corresponding vertices are A = P, B = Q, C = R.
2. Corresponding sides are AB = PQ, BC = QR , AC = PR .
3. Corresponding angles : $\angle A = \angle P$, $\angle B = \angle Q$, $\angle C = \angle R$.

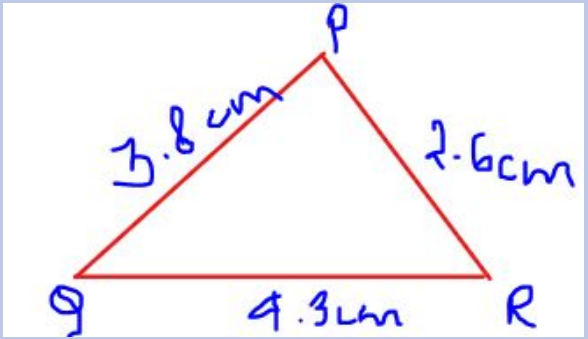
Congruence for triangles

SSS Congruence Rule (Side – Side – Side)

The triangles are said to be congruent if all the three sides of one triangle are equal to the three corresponding sides of another triangle.

1) In the given triangles ABC and PQR, AB = 3.8 cm, BC = 4.3cm, AC = 2.6 cm, PQ = 3.8 cm, QR = 4.3cm and PR = 2.6cm. So, both of these figures are congruent.





SAS Congruence Rule(Side – Angle – Side)

The triangles are said to be congruent if the correspondence, two sides and the angle included between them of a triangle are equal to two corresponding sides and the angle included between them of another triangle.

In this figure, triangle ABC is congruent to triangle FED.