

LESSON PLAN CLASS 9 [2019-2020]

Class	Subject	Time Slot	Lesson	Topic
IX	MATHS	35Min+35Min P3+P4	Triangles	Problems based on concept of congruency. (SAS and ASA)
Expected Learning Outcome: The learners will be able to : 1. Apply the congruence rules of ASA and SAS for proving two triangles congruent.				
Expected skill development: - Developing connections of different properties of triangles. - Logical thinking while proving two triangles congruent. - Visual and spatial ability to identify the type of congruency being used. - Procedural thinking while finding the corresponding sides and angles. - Problem solving while doing HOTS based questions.				

FLOW OF LESSON WITH RESPECT TO TIME (Introduction/warm-up, Content, Think Line, Closure)

Pedagogy	Content
<u>(5 Min) Warm Up</u> <u>Interactive method</u> The facilitator revises the terms discussed.	The facilitator recalls two important congruency criteria – SAS and ASA. (SAS Congruence 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. (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 the other triangle.

(20 Mins) Demonstration by facilitator on board.

(Demonstration / Discussion method)

The facilitator takes up a question and tells the learners the exact way to write the solution of the problem.

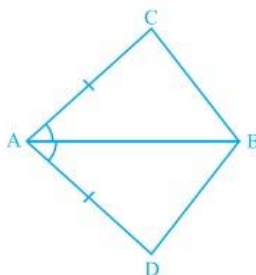
The method is

Step 1 Given (write the information provided in the question)

Step 2 – to find / prove (write the things that are to be proved)

Step 3 – construction (write if there is any construction done)

1. In quadrilateral ACBD, $AC = AD$ and AB bisects $\angle A$ (see Fig). Show that $\triangle ABC \cong \triangle ABD$. What can you say about BC and BD?

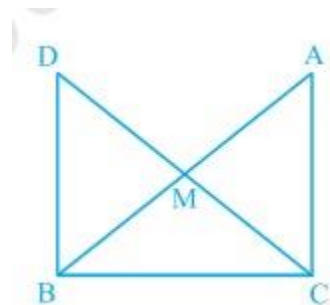


Ans : In $\triangle ABC$ and $\triangle ABD$,
 $AC = AD$ (Given)
 $\angle CAB = \angle DAB$ (AB bisects $\angle A$)
 $AB = AB$ (Common)
Therefore, $\triangle ABC \cong \triangle ABD$ (By SAS congruence rule)
 $BC = BD$ (By CPCT)
Therefore, BC and BD are Of equal lengths.

(5 Minutes) Closure:

In right triangle ABC, right angled at C, M is the mid-point of hypotenuse AB. C is joined to M and produced to a point D such that $DM = CM$. Point D is joined to point B (see Figure). Show that:

- (i) $\triangle AMC \cong \triangle BMD$
- (ii) $\angle DBC$ is a right angle.
- (iii) $\triangle DBC \cong \triangle ACB$
- (iv) $CM = \frac{1}{2} AB$



Ans : (i) In $\triangle AMC$ and $\triangle BMD$,
 $AM = BM$ (M is the mid-point Of AB)
 $\angle AMC = \angle BMD$ (Vertically opposite angles)
 $CM = DM$ (Given)
Therefore, $\triangle AMC \cong \triangle BMD$ (By SAS congruence rule)
Therefore $AC = BD$ (By CPCT)
And, $\angle ACM = \angle BDM$ (By CPCT)

(ii) $\angle ACM = \angle BDM$
 $\angle ACM$ and $\angle BDM$ are alternate interior angles.
Since alternate angles are equal, It can be said that $DB \parallel AC$
 $\angle DBC + \angle ACB = 180^\circ$ (Co-interior angles)
 $\angle DBC + 90^\circ = 180^\circ$
 $\angle DBC = 90^\circ$

(iii) In $\triangle DBC$ and $\triangle ACB$,
 $DB = AC$ (Already proved)
 $\angle DBC = \angle ACB$ (Each 90°)
 $BC = CB$ (Common)
 Therefore, $\triangle DBC \cong \triangle ACB$ (SAS congruence rule)

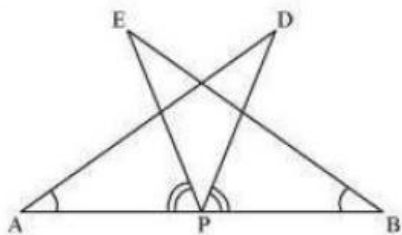
(iv) $\triangle DBC \cong \triangle ACB$
 $AB = DC$ (By CPCT)
 $AB = 2\text{ CM}$
 $\therefore CM = \frac{1}{2} AB$
 $\therefore CM = \frac{1}{2} AB$

a) Proposed Questions (must include the questions asked in the classroom and the ones given as class-work in the notebook)

AB is a line segment and P is its mid-point. D and E are points on the same side of AB such that $\angle BAD = \angle ABE$ and $\angle EPA = \angle DPB$ (see Figure). Show that

(i) $\triangle DAP \cong \triangle EBP$

(ii) $AD = BE$



It is given that $\angle EPA = \angle DPB$

$\angle EPA + \angle DPE = \angle DPB + \angle DPE$

Therefore, $\angle DPA = \angle EPB$

In $\triangle DAP$ and $\triangle EBP$, $\angle DAP = \angle EPB$ (Given)

$AP = BP$ (P is mid-point of AB)

$\angle DPA = \angle EPB$ (From above)

Therefore, $\triangle DAP \cong \triangle EBP$ (ASA congruence rule)

Therefore, $AD = BE$ (By CPCT)

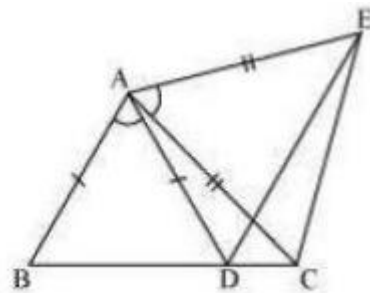
Ans : In $\angle ABD$ and $\angle BAC$,
 $AD = BC$ (Given)
 $\angle DAB = \angle CBA$ (Given)
 $AB = BA$ (Common)
 $\therefore \triangle ABD = \triangle BAC$ (By SAS congruence rule)
 $\therefore BD = AC$ (By CPCT)
 $\therefore \triangle ABD = \triangle BAC$ (By SAS congruence rule)
 $\therefore BD = AC$ (By CPCT)
 And, $\angle ABD = \angle BAC$ (By CPCT)

b) Evaluation/Assessment: Peer discussion will be done. Teacher will assess the children randomly and also through student teacher interaction.

Learners on the way
 It is given that $\triangle ABC \cong \triangle RPQ$.
 Is it true to say that $BC = QR$? Why?

Advanced Learners

In Figure, $AC = AE$, $AB = AD$ and $\angle BAD = \angle EAC$. Show that $BC = DE$.



Materials needed/Resources: NCERT Text book.

Common Misconceptions:
 SAS is axiom and ASA is a theorem which is proved by using the axiom SAS.

Addressing the Misconceptions:
 Explanation by taking various mathematical statements by showing them.

HOME ASSIGNMENTS:

Do exercise 7.1 Q No 3,4, 5.

Teaching Methodology :

- Discussion/ iteration method.
- Lecture
- Demonstation.