CHAPTER-7

Triangles

Suggested Formative Assessment Tasks

Task-1: Oral Assessment

Topic	Triangles.
Nature of task	Pre Content
Content Coverage	Basic concepts related to congruency & triangles.
Task	Oral Assessment.
Execution of task	This task may be performed in the classroom in the first 15 minutes of a teaching period. To save time oral assessment may be done in groups.
Duration	15 minutes.
Criteria for assessment	Teacher may ask questions in groups and observe the level of understanding. It is not necessary to give marks for this assessment. It may be used for diagnostic purpose.

### Class Worksheet / Oral Assessment:

1. What do you understand by congruency ?

2. Give examples of congruent figures from your surroundings.

3. What is triangle ?

4. What are the various parts of a triangle ?

5. What do you understand by side of a triangle ?

6. What is angle ?

7. How many types of triangle are there ?

8. Classify triangles on the basis of their sides.

9. Classify triangles on the basis of their angles.

10. What is exterior angle of a triangle ? How is it different from the interior angle of the triangle? What is the relation between them ?

Task-2: Crossword Puzzle Worksheet

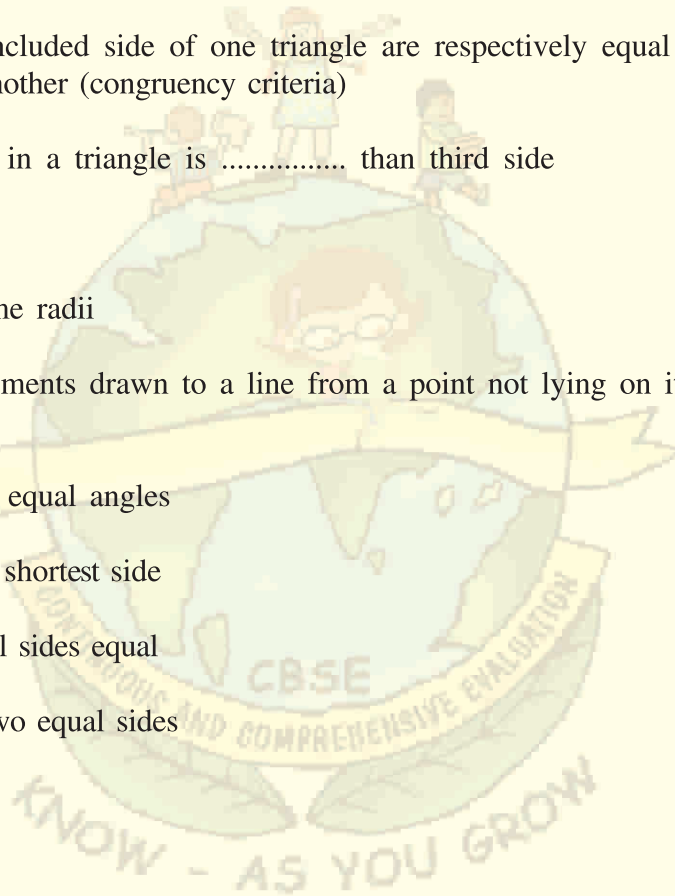|	
Topic	Triangles.
Nature of task	Content delivery.
Content Coverage	Congruency of triangles, Properties of triangle, Inequalities in a triangle.
Learning Objectives	To test the basic concepts related to the chapter.
Task	Crossword Puzzle
Execution of task	This task may be performed in the classroom. Students can be given the photocopy of the worksheet.
Duration	10 − 15 minutes.
Criteria for assessment	• Time involved in solving the worksheet.
	• Rating scale for the worksheet.

Crossword Puzzle Sheet
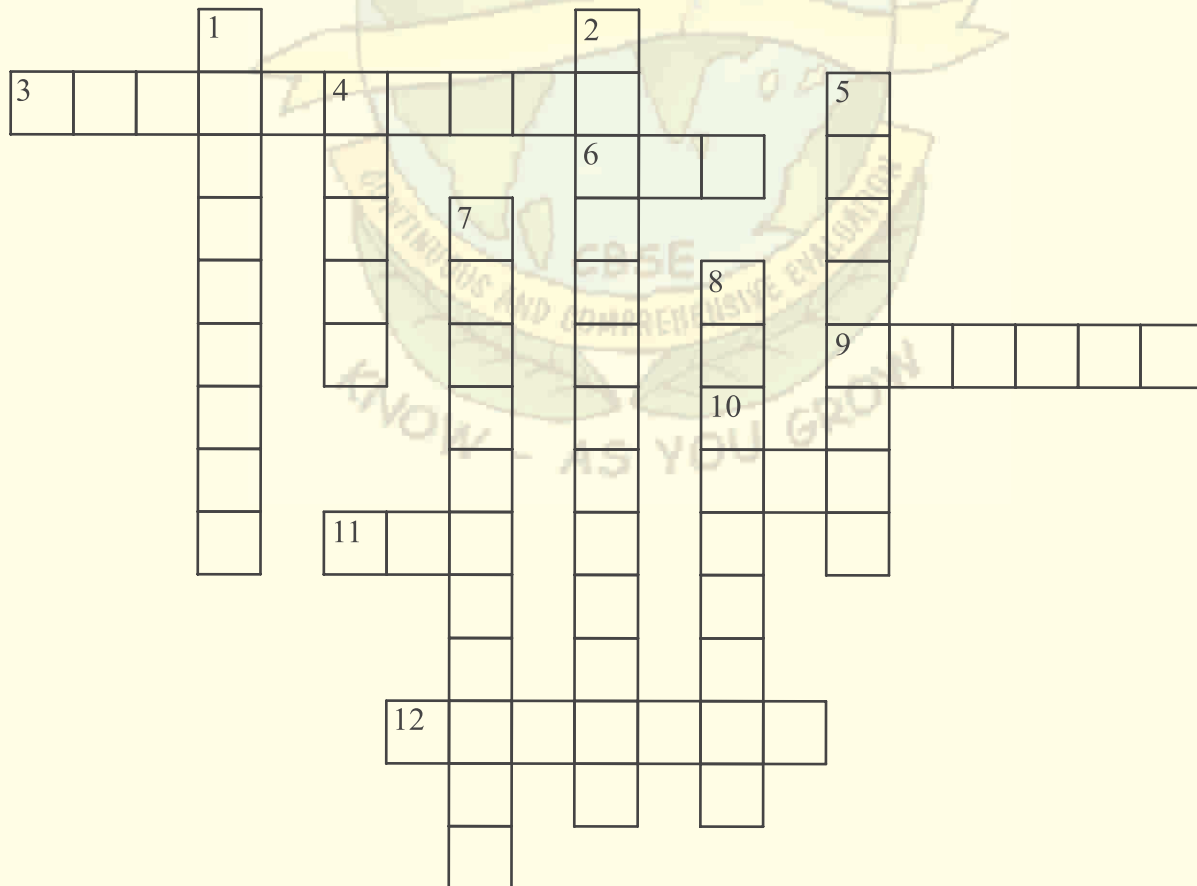
Across

3.　　Longest side in a right triangle

6.　　Hypotenuse and one side of a right triangle are respectively equal to hypotenuse and one side of another right triangle (congruency criteria)

9.　　Side opposite to greater angle

10.　　Three sides of one triangle are equal to corresponding sides of another triangle (congruency criteria)

11.　　Two angles and included side of one triangle are respectively equal to two angles and included side of another (congruency criteria)

12.　　Sum of two sides in a triangle is .... than third side

Down

1.　　Two circles of same radii

2.　　Of all the line segments drawn to a line from a point not lying on it..................distance is the shortest

4.　　Sides opposite the equal angles

5.　　Angle opposite to shortest side

7.　　Triangles having all sides equal

8.　　Triangles having two equal sides

Task-3: Practice Sheet-MCQ

Topic	Triangles.
Nature of task	Post Content
Content Coverage	Complete Chapter
Task	MCQ
Execution of task	Printed assignment may be given after completing the chapter. After completion of worksheet, teacher can ask children to interchange their sheets & a quick evaluation can be done by class discussion.
Duration	10-15 minutes
Criteria for assessment	Teacher may prepare a rating scale according to the marks assigned to this task.

Multiple Choice Questions

Choose the correct answer from the given four options:

1. If one angle of a triangle is equal to the sum of other two angles, then the triangle is

   A. an isosceles triangle   B. an obtuse triangle

   C. an equilateral triangle   D. a right triangle

2. In the given figure, the ratio $\angle ABD : \angle ACD$ is

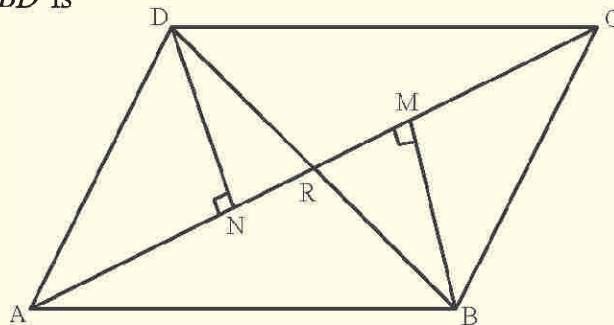   A. 1:1   B. 2:1   C. 1:2   D. 2:3
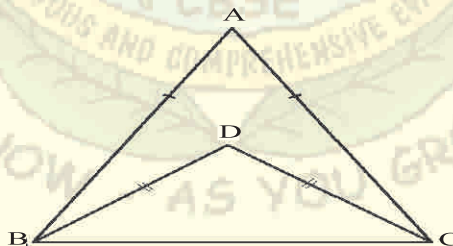
3. $\angle x$ & $\angle y$ are exterior angles of a $\triangle ABC$, at the points B and C respectively. Also $\angle B > \angle C$, then, relation between $\angle x$ and $\angle y$ is

   A. $\angle x > \angle y$ B. $\angle x < \angle y$

   C. $\angle x = \angle y$ D. none of these

4. In the given figure, *PQ* > *PR*, *QS* and *RS* are the bisectors of ∠*Q* and ∠*R* respectively. Then
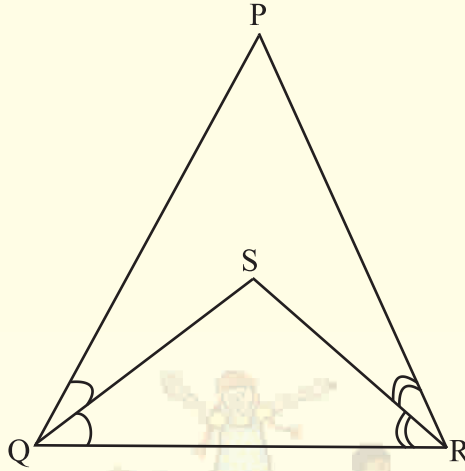
   A.   *SQ* = *SR*   B.   *SQ* > *SR*

   C.   *SQ* < *SR*   D.   none of these

5. If the bisector of vertical angle of a triangle is perpendicular to the base of triangle then the triangle is

   A.   Scalene triangle   B.   obtuse angled triangle

   C.   Acute angled triangle   D.   equilateral triangle

6. In △*ABC* and △*PQR*, three equality relations between same parts are as follows: *AB* = *QP*, ∠*B* = ∠*P* and *BC* = *PR*

State which of the congruence conditions applies:

   A.   SAS   B.   ASA   C.   SSS   D.   RHS

7. *D, E, F* are the mid points of the sides *BC, CA* and *AB* respectively of △*ABC*. Then △*DEF* is congruent to triangle

   A.   *ABC*   B.   *AEF*

   C.   *BFD, CDE*   D.   *AFE, BFD, CDE*

8. In quadrilateral *ABCD*, *BM* and *DN* are drawn perpendicular to *AC* such that *BM* = *DN*. If *BR* = 8 cm, then *BD* is

   A.   4 cm   B.   2 cm   C.   12 cm   D.   16 cm

Task-4: Class Worksheet

| Topic	Triangles.
Nature of task	Post Content
Content Coverage	Congruence of triangles, Properties of triangle, Inequalities in a triangle.
Learning Objectives	• To learn about congruent triangles. • To understand different criteria for congruence of triangles viz. SSS, SAS, RHS, AAS, ASA. • To learn some properties of triangle. • To understand Inequalities in a triangle.
Task	Class Worksheet
Execution of task	Printed worksheet should be given to each child with appropriate space for making the constructions.
Duration	2 periods
Criteria for assessment	Teacher should assess this task with the help of rubric so that children get to know their topic related specific problems & can revisit those subtopics where they need improvement.

Class Worksheet

1. The angles of triangle are $(x + 10°)$, $(2x – 30°)$ and $x°$. Find the value of x.

2. In the given figure $AB \parallel CD$. PR and QR are angle bisectors of a $\angle BPQ$ and $\angle PQD$ respectively. Show that angle $PRQ = 90°$.
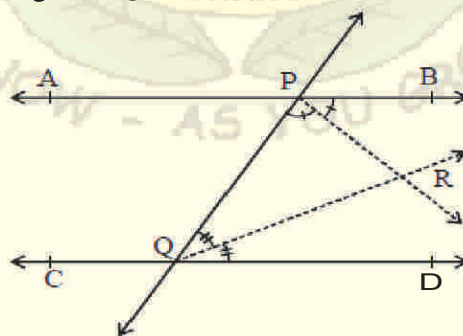
3. Write 'True' or 'false' for each of the following:
   (A) The angles of a triangle are 90°, 20°, 90°.
   (B) A triangle can have at most one obtuse angle.
   (C) A triangle can not have all acute angles.
   (D) In a $\triangle ABC$, BC = AB. implies $\angle B = \angle C$.

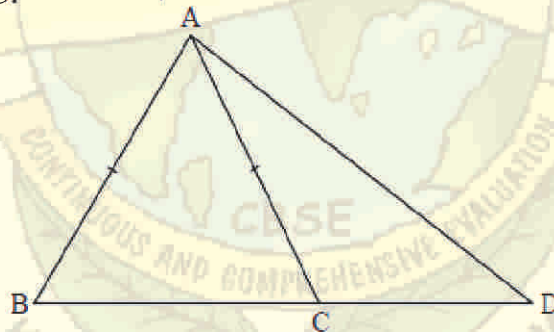**4.** In given figure $AD \perp BC$, AE is the angle bisector of $\angle BAC$. Find $\angle DAE$.
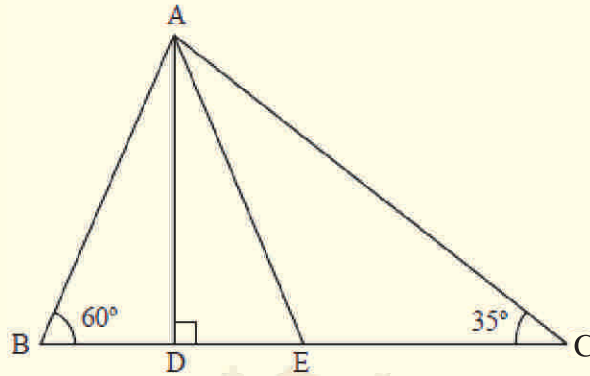
Hint:

Step 1 — Find $\angle DAC$

Step 2 — Find $\angle BAD$

Step 3 — $\angle BAE = \angle EAC$.

5. If the bisector of the vertical angle of a triangle bisects the base, prove that the triangle is isosceles.

6. In the given figure, ABC is a triangle in which $AB = AC$. If D be a point on BC produced, prove that $AD > AC$.

(**Hint:** $\angle ACD$ is the ext. angle of $\angle ACD$)

7. If the bisector of the exterior vertical angle of a triangle is parallel to the base, then prove that the triangle is isosceles.

8. Prove that the medians drawn on two equal sides of an isosceles triangle are equal.

Task-5: Home Assignment

| Topic	Triangles.
Nature of task	Post Content
Content Coverage	Complete Chapter
Learning Objectives	• To get an idea of congruent figures. • To learn about congruent triangles. • To understand different criteria for congruence of triangles viz. SSS, SAS, RHS, AAS, ASA. • To learn some properties of triangles. • To understand Inequalities in a triangle.
Task	Home Assignment.
Execution of task	Printed assignment may be given after completing the chapter.
Duration	2 days.
Criteria for assessment	Follow Rubric for H.W/Assignments
Follow up	Reference material in the form of "important points to remember" can be given as a support material.

Home Assignment

1. If *D* is the midpoint of the hypotenuse *AC* of a right triangle *ABC*, Prove that *BD* =1/2*AC*.

2. If the bisector of vertical angle of a triangle bisects the base, prove that the triangle is isosceles.

3. *O* is any point in the interior of △*ABC*. Prove that

   (i) *AB* + *AC* > *OB* + *OC*

   (ii) *AB* + *BC* + *CA* > *OA* + *OB* + *OC*

4. In the figure if ∠*x* = ∠*y* and *AB* = *CB* Prove that *AE* = *CD*.
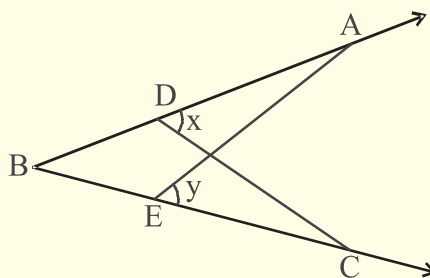
5. In the fig *PQRS* is a quadrilateral and *T* and *U* are respectively points on *PS* and *RS* such that $PQ = RQ$, $\angle PQT = \angle RQU$ and $\angle TQS = \angle UQS$ Prove that $QT = QU$.
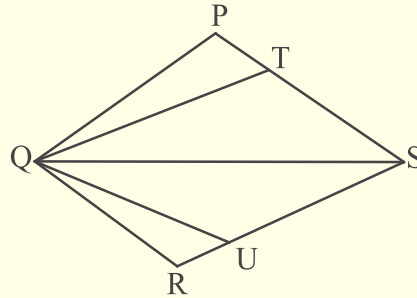
6. In a right angle triangle, one acute angle is double the other. Prove that hypotenuse is double the smallest side.

7. ABC is a triangle in which $\angle B = 2\angle C$. *D* is a point on *BC* such that *AD* bisects $\angle BAC$ and $AB = CD$. Prove that $\angle BAC = 72°$.

8. In fig if AD is the bisector of $\angle A$, show that:

(i)   AB > BD   (ii)   AC > CD
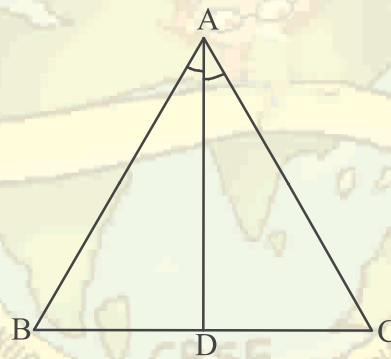
9. In fig *ABCD* is a square. *M* is the mid point of *AB* and $PQ \perp CM$. Prove that $CP = CQ$.
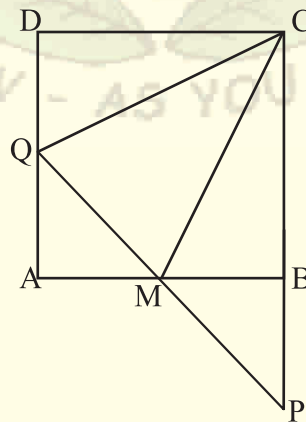
10. It two isosceles triangles have a common base, prove that the line joining the vertices bisects the base at right angle.

Task-6: Hands on activity

Topic	Triangles.
Nature of task	During delivery of content
Learning Objectives	• To verify that sum of two sides of a triangle is greater than the third side.
Task	Math activity
Execution of task	An instruction sheet containing information about material required & steps involved to do the activity can be given to students for reference. They will be then asked to perform the activity & record the outcome in the recording sheet.
Duration	1 period
Criteria for assessment	This activity will be a part of Math activity , so it will be assessed according to the following parameters: Observation on thinking skills Class Ethics Performance of activity File Record (marks may be allotted by the teacher accordingly)

Instruction Sheet

Objective: To verify, using broom sticks, that a triangle is possible only if the sum of lengths of any two sides is greater than the third side.

Previous Knowledge: Knowledge of a triangle & its parts.

Material Required: Sets of broom sticks of following lengths, scale, glue, paper sheet.

  Set 1: 5 cm, 7 cm, 11 cm.
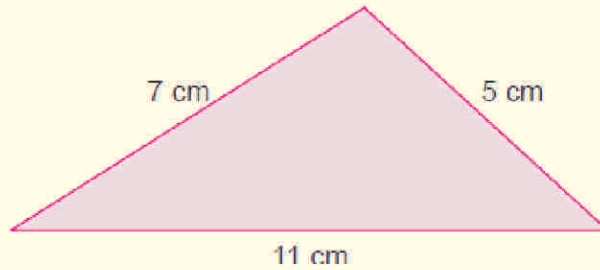
  Set 2: 5 cm, 7 cm, 14 cm.
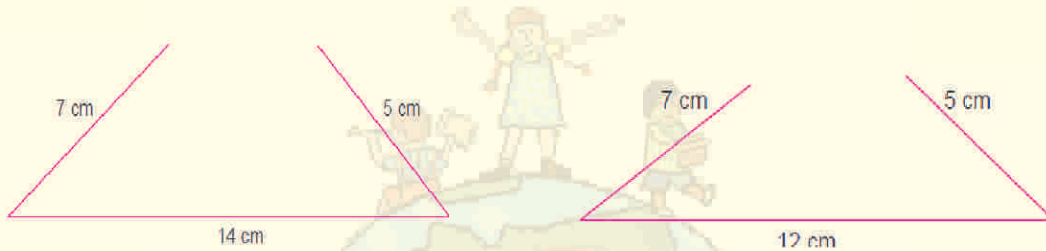
  Set 3: 5 cm, 7 cm, 12 cm.

Procedure:

  1) Take Broom sticks of lengths 5 cm, 7 cm & 11 cm (Set 1).

2)   Try to make a triangle using these broom sticks. Do you get a triangle?

3)   Now, take the other sets of broom sticks & repeat steps 1 & 2. Do you get a triangle?

Observations:

For Set 1:

$5 + 7 > 11$

$5 + 11 >$ …….

$7 + 11 >$ …….

Triangle can ……………….. (be formed/ not be formed).

For Set 2:

$14 + 7 > 5$

$5 + 14 >$ …….

$7 + 5$ ……. 14

Triangle can ……………….. (be formed/ not be formed).

For Set 3:

$12 + 7 > 5$

$5 + 12 >$ …….

$7 + 5$ ……. 12

Triangle can ……………….. (be formed/ not be formed).

Conclusion:

Sum of two sides of a triangle is always ……………….. than the third side.