

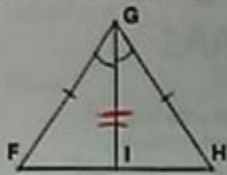
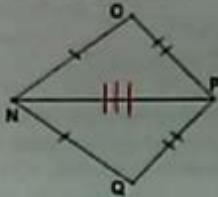
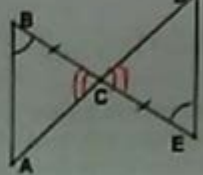
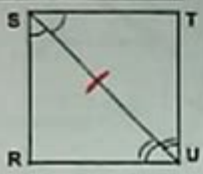

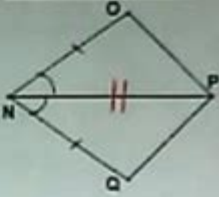
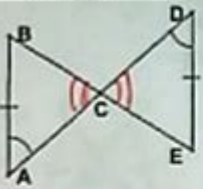
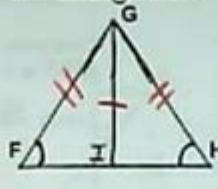
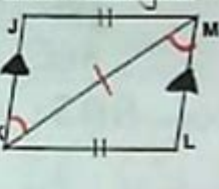
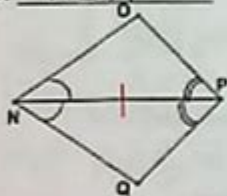
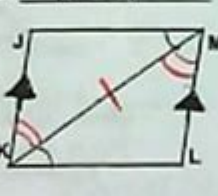
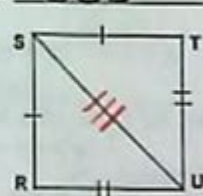
Congruent Triangles Answer Key

Name - _____

Period - _____

Triangle Congruence Worksheet

state whether each pair of triangles is congruent
SSS, SAS, ASA, AAS, HL or not congruent

1. <u>SAS</u> 	2. <u>SSS</u> 	3. <u>ASA</u> 
4. <u>ASA</u> 	5. <u>AAS</u> 	6. <u>SAS</u> 
7. <u>AAS</u> 	8. <u>not congruent</u> 	9. <u>not congruent</u> 
10. <u>ASA</u> 	11. <u>ASA</u> 	12. <u>SSS</u> 

alike, providing clarity on the principles of triangle congruence in geometry. Understanding congruence in triangles not only lays the foundation for more complex geometric concepts but also enhances problem-solving skills. This article will delve into the different types of congruence, methods to determine triangle congruence, and provide an answer key for common triangle congruence problems.

Understanding Congruent Triangles

Congruent triangles are triangles that have the same size and shape. This means that all corresponding sides and angles are equal. When two triangles are congruent, one can be transformed into the other through rotations, translations, or reflections. This property is fundamental in geometry and has several practical applications in real-world scenarios, such as engineering, architecture, and computer graphics.

Types of Congruence

There are several criteria to determine if two triangles are congruent. These criteria are based on the measurement of sides and angles. The primary methods include:

- **SSS (Side-Side-Side) Congruence:** If three sides of one triangle are equal to three sides of another triangle, the triangles are congruent.
- **SAS (Side-Angle-Side) Congruence:** If two sides and the included angle of one triangle are equal to two sides and the included angle of another triangle, the triangles are congruent.
- **ASA (Angle-Side-Angle) Congruence:** If two angles and the included side of one triangle are equal to two angles and the included side of another triangle, the triangles are congruent.
- **AAS (Angle-Angle-Side) Congruence:** If two angles and a non-included side of one triangle are equal to two angles and a corresponding non-included side of another triangle, the triangles are congruent.
- **HL (Hypotenuse-Leg) Congruence:** This method applies to right triangles, stating that if the hypotenuse and one leg of a right triangle are equal to the hypotenuse and one leg of another right triangle, the two triangles are congruent.

Methods to Prove Triangle Congruence

To demonstrate that two triangles are congruent, one must provide evidence based on the criteria mentioned above. Here are some steps and tips for proving triangle congruence:

1. Identify Given Information

Start with the information provided in the problem. Look for measurements of sides and angles. This information will guide you in selecting the appropriate congruence criterion.

2. Determine the Congruence Criterion

Based on the given information, decide which congruence criterion can be applied. For instance, if you have all three sides, SSS is the way to go. If you have two sides and an included angle, then use SAS.

3. Draw the Triangles

Visual representation can help in understanding the problem better. Draw the triangles according to the information provided. Label all known sides and angles clearly.

4. Apply the Congruence Criterion

Use the chosen criterion to compare the triangles. If the conditions of the criterion are met, conclude that the triangles are congruent.

5. Write a Justification

Clearly state your findings and provide a justification for why the triangles are congruent. This could be a simple statement like, "By SSS, triangle ABC is congruent to triangle DEF."

Common Congruent Triangles Problems

Here are some typical problems involving congruent triangles that can be solved using the congruence criteria:

Example Problem 1: SSS Congruence

Given triangle ABC with sides $AB = 5$ cm, $AC = 7$ cm, and $BC = 8$ cm, and triangle DEF with sides $DE = 5$ cm, $DF = 7$ cm, and $EF = 8$ cm. Are the triangles congruent?

Answer Key:

By SSS, triangle ABC is congruent to triangle DEF.

Example Problem 2: SAS Congruence

In triangle GHI, if $GH = 4$ cm, $HI = 6$ cm, and angle $H = 40$ degrees, and in triangle JKL, $JK = 4$ cm, $KL = 6$ cm, and angle $K = 40$ degrees. Are the triangles congruent?

Answer Key:

By SAS, triangle GHI is congruent to triangle JKL.

Example Problem 3: ASA Congruence

If in triangle MNO, angle $M = 50$ degrees, angle $N = 60$ degrees, and side $MN = 5$ cm, and in triangle PQR, angle $P = 50$ degrees, angle $Q = 60$ degrees, and side $PQ = 5$ cm. Are the triangles congruent?

Answer Key:

By ASA, triangle MNO is congruent to triangle PQR.

Example Problem 4: AAS Congruence

Triangle RST has angles $R = 30$ degrees, $S = 70$ degrees, and side $RS = 10$ cm. Triangle UVW has angles $U = 30$ degrees, $V = 70$ degrees, and side $UV = 10$ cm. Are the triangles congruent?

Answer Key:

By AAS, triangle RST is congruent to triangle UVW.

Example Problem 5: HL Congruence

In right triangle ABC, the hypotenuse $AC = 13$ cm, and one leg $AB = 5$ cm. In right triangle DEF, the hypotenuse $DF = 13$ cm, and one leg $DE = 5$ cm. Are the triangles congruent?

Answer Key:

By HL, triangle ABC is congruent to triangle DEF.

Conclusion

Understanding **congruent triangles answer key** is essential for mastering the concept of triangle congruence in geometry. By familiarizing oneself with the different criteria for congruence and practicing with various problems, students can enhance their geometric reasoning and problem-solving skills. Whether in a classroom setting or preparing for exams, having a solid grasp of congruent triangles will undoubtedly aid in achieving academic success.

Frequently Asked Questions

What are congruent triangles?

Congruent triangles are triangles that are identical in shape and size, meaning their corresponding sides and angles are equal.

How can you determine if two triangles are congruent?

Two triangles can be determined as congruent using several criteria, including Side-Side-Side (SSS), Side-Angle-Side (SAS), Angle-Side-Angle (ASA), Angle-Angle-Side (AAS), and Hypotenuse-Leg (HL) for right triangles.

What is the Side-Side-Side (SSS) congruence postulate?

The Side-Side-Side (SSS) congruence postulate states that if all three sides of one triangle are equal to the corresponding three sides of another triangle, the triangles are congruent.

What does the Angle-Side-Angle (ASA) congruence theorem state?

The Angle-Side-Angle (ASA) congruence theorem states that if two angles and the included side of one triangle are equal to two angles and the included side of another triangle, the triangles are congruent.

Can two triangles be congruent if they are not oriented the same way?

Yes, two triangles can still be congruent even if they are not oriented the same way; congruence is about the equality of sides and angles, not their position.

What is the significance of congruent triangles in geometry?

Congruent triangles are significant in geometry as they help in proving theorems, solving problems related to similarity and congruence, and establishing relationships between different geometric figures.

How does the Hypotenuse-Leg (HL) theorem apply to right triangles?

The Hypotenuse-Leg (HL) theorem states that if the hypotenuse and one leg of one right triangle are equal to the hypotenuse and one leg of another right triangle, the triangles are congruent.

What is the difference between congruent triangles and similar triangles?

Congruent triangles are identical in size and shape, while similar triangles have the same shape but may differ in size; their corresponding sides are in proportion, and their angles are equal.

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Congruent Triangles We all know that a triangle has three angles, three sides and three vertices. Depending on similarities in the measurement of sides, triangles are classified as equilateral, isosceles and scalene. The comparison done in this case is between the sides and angles of the same triangle. When we compare two different triangles we follow a different set of rules. Two ...

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What are the differences between similar triangles and congruent ...

Congruent figures are the same shape and size. Similar figures are the same shape, but not necessarily the same size. Note that if two figures are congruent, then they are also similar, but not vice-versa.

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If two triangles are congruent, are they similar? Please ... - Toppr

If two triangles are congruent then all corresponding sides as well as corresponding angles of one triangle are equal to those of other triangles. This can happen in four cases one - when all sides of triangles are equal, two - if one side and two angles of one are equal to one side and two angles of other triangle.

In Delta ABC and Delta PQR, AB = AC, angle C = angle P and

Two triangles are congruent if their corresponding sides are equal in length and their corresponding

angles are equal. In geometry, an isosceles triangle is a triangle that has two sides of equal length. Therefore, we can say that the given triangles are neither congruent nor isosceles. Therefore, ABC, P QR are not congruent nor isosceles.

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The degree measure of each of the semi-circles is 180 degrees. Congruent Circles If the radii of two circles are exactly the same value, then the circles are called to be congruent. Concentric Circles Two or more circles that have different radii but the same center are called as concentric circles. Solved Example For You Q.

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