Congruent Triangles Worksheet

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Part 1: Building a Foundation

Which of the following is a criterion for triangle congruence?

Hint: Think about the different ways triangles can be proven congruent.

- ◯ A) Angle-AngLE-AngLE (AAA)
- ◯ B) Side-Side-Side (SSS)
- ◯ C) Side-AngLE-AngLE (SAA)
- ◯ D) Angle-Side-Side (ASS)

Which of the following statements are true about congruent triangles?

Hint: Consider the properties of congruence.

- ☐ A) They have equal corresponding angles.
- ☐ B) They have equal corresponding sides.
- ☐ C) They must be in the same orientation.
- ☐ D) They can be different sizes.

Explain what it means for two triangles to be congruent. Include a description of the properties that must be equal.

Hint: Think about the definitions and properties of triangles.

List the criteria used to determine if two triangles are congruent. Provide the abbreviation for each criterion.

Hint: Recall the different methods for proving triangle congruence.

1. What is SSS?

2. What is SAS?

3. What is ASA?

4. What is AAS?

Part 2: Comprehension and Application

Which of the following is not a valid reason for proving two triangles congruent?

Hint: Consider the criteria for triangle congruence.

- ◯ A) SSS
- ◯ B) SAS
- ◯ C) SSA
- ◯ D) ASA

If triangle ABC is congruent to triangle DEF, which of the following statements are true?

Hint: Think about the properties of congruent triangles.

- ☐ A) Angle A is equal to angle D.
- ☐ B) Side AB is equal to side DE.
- ☐ C) Triangle ABC is a mirror image of triangle DEF.
- ☐ D) Triangle ABC and triangle DEF have the same area.

Describe how the ASA criterion can be used to prove two triangles are congruent. Include an example with hypothetical angle and side measurements.

Hint: Think about the definition of ASA and how it applies.

Given triangles PQR and XYZ, if PQ = XY, QR = YZ, and angle PQR = angle XYZ, which congruence criterion can be used to prove the triangles are congruent?

Hint: Consider the information given about the sides and angles.

- ◯ A) SSS
- ◯ B) SAS
- ◯ C) ASA
- ◯ D) AAS

In a construction project, two triangular beams need to be congruent. Which of the following measurements will ensure congruence?

Hint: Think about the criteria for triangle congruence.

- ☐ A) Three sides of one beam equal three sides of the other.
- ☐ B) Two angles and a non-included side of one beam equal two angles and a non-included side of the other.
- ☐ C) Two sides and the included angle of one beam equal two sides and the included angle of the other.
- ☐ D) Two angles and the included side of one beam equal two angles and the included side of the other.

Part 3: Analysis, Evaluation, and Creation

Which statement correctly analyzes the relationship between congruent triangles?

Hint: Consider the properties of congruence.

- ◯ A) Congruent triangles have the same perimeter but different areas.
- ◯ B) Congruent triangles have corresponding sides and angles that are equal.
- ◯ C) Congruent triangles can be different shapes.
- ◯ D) Congruent triangles are always right triangles.

Analyze the following pairs of triangles and determine which pairs are congruent based on the given information:

Hint: Consider the properties of congruence.

- [ ] A) Triangles with sides 3, 4, 5 and sides 6, 8, 10.
- [ ] B) Triangles with angles 30°, 60°, 90° and angles 30°, 60°, 90°.
- [ ] C) Triangles with sides 5, 5, 8 and sides 5, 5, 8.
- [ ] D) Triangles with angles 45°, 45°, 90° and angles 45°, 45°, 90°.

Explain how the transitive property of congruence can be used to prove that two triangles are congruent if they are each congruent to a third triangle.

Hint: Think about the implications of congruence.

Which of the following scenarios best demonstrates the use of triangle congruence in real-world applications?

Hint: Consider practical applications of congruence.

- ◯ A) Calculating the area of a circle.
- ◯ B) Designing a bridge with triangular supports.
- ◯ C) Measuring the height of a building using a shadow.
- ◯ D) Estimating the volume of a cylinder.

Evaluate the following statements and select those that correctly describe the importance of congruent triangles in geometry:

Hint: Think about the role of congruence in geometric proofs.

- [ ] A) They help in proving the properties of other geometric shapes.
- [ ] B) They are only useful in theoretical mathematics.
- [ ] C) They ensure precision in construction and design.
- [ ] D) They simplify complex geometric proofs.

Create a real-world problem that involves proving the congruence of two triangles. Describe the scenario, the given information, and how you would solve it using one of the congruence criteria.

Hint: Think about practical applications of triangle congruence.

Propose two different methods to prove that two given triangles are congruent, using different congruence criteria. Explain the reasoning behind each method.

Hint: Consider the various criteria for triangle congruence.

1. Method 1: SSS

2. Method 2: ASA