Similar Triangles Worksheet Questions and Answers PDF

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Part 1: Building a Foundation

Which of the following statements are true about similar triangles?

Hint: Consider the properties of similar triangles.

- [x] **A) They have equal corresponding angles. ✓**
- [x] **B) Their corresponding sides are proportional. ✓**
- [ ] C) They have the same area.
- [ ] D) They have the same perimeter.

> Similar triangles have equal corresponding angles and their corresponding sides are proportional.

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> Similar triangles have equal corresponding angles and proportional sides.

Explain what it means for two triangles to be similar. Include a description of their properties.

Hint: Think about angles and side lengths.

Two triangles are similar if their corresponding angles are equal and their corresponding sides are in proportion.

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Hint: Think about angles and side lengths.

Two triangles are similar if their corresponding angles are equal and their corresponding sides are proportional.

List the three criteria used to determine if two triangles are similar.

Hint: Consider the different combinations of angles and sides.

1. Criterion 1

Angle-Angles (AA)

2. Criterion 2

Side-Side-Side (SSS)

3. Criterion 3

Side-Angles-Side (SAS)

The three criteria are Angle-Angles (AA), Side-Side-Side (SSS), and Side-Angles-Side (SAS).

Part 2: Understanding and Interpretation

If two triangles are similar and the ratio of their corresponding sides is 3:4, what is the ratio of their perimeters?

Hint: Consider how the ratios of sides relate to the perimeter.

- ◯ **A) 3:4 ✓**
- ◯ B) 4:3
- ◯ C) 9:16
- ◯ D) 16:9

The ratio of the perimeters of similar triangles is the same as the ratio of their corresponding sides.

If two triangles are similar and the ratio of their corresponding sides is 3:4, what is the ratio of their perimeters?

Hint: Consider how perimeter relates to side lengths.

- ◯ **A) 3:4 ✓**
- ◯ B) 4:3
- ◯ C) 9:16
- ◯ D) 16:9

The ratio of the perimeters of similar triangles is the same as the ratio of their corresponding sides.

Which of the following transformations can result in similar triangles?

Hint: Think about how triangles can be manipulated.

- ☐ **A) Translation ✓**
- ☐ **B) Rotation ✓**

- [x] **C) Dilation ✓**
- [x] **D) Reflection ✓**

> Transformations such as translation, rotation, and dilation can result in similar triangles.

Which of the following transformations can result in similar triangles?

Hint: Think about geometric transformations.

- [ ] A) Translation
- [ ] B) Rotation
- [x] **C) Dilation ✓**
- [ ] D) Reflection

> Transformations such as dilation can create similar triangles.

Describe how the AA criterion can be used to prove that two triangles are similar.

Hint: Consider the implications of having two equal angles.

> **The AA criterion states that if two angles of one triangle are equal to two angles of another triangle, then the triangles are similar.**

Describe how the AA criterion can be used to prove that two triangles are similar.

Hint: Consider the implications of equal angles.

The AA criterion states that if two angles of one triangle are equal to two angles of another triangle, the triangles are similar.

Part 3: Application and Analysis

A triangle has sides of lengths 6 cm, 8 cm, and 10 cm. A similar triangle has a shortest side of 3 cm. What is the length of its longest side?

Hint: Use the ratio of the sides to find the missing length.

- ◯ A) 4 cm
- ◯ B) 5 cm
- ◯ **C) 7.5 cm ✓**
- ◯ D) 10 cm

The longest side of the similar triangle can be found using the ratio of the sides.

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- ◯ D) 10 cm

The longest side of the similar triangle can be found using the ratio of the sides.

In a map, a 1 cm line represents 5 km. If two cities are 20 km apart, how far apart are they on the map?

Hint: Convert the distance using the scale provided.

- ☐ **A) 2 cm ✓**
- ☐ B) 3 cm
- ☐ C) 4 cm
- ☐ D) 5 cm

To find the distance on the map, divide the actual distance by the scale factor.

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> To find the distance on the map, divide the real distance by the scale factor.

Given two similar triangles, where one has sides of 9 cm, 12 cm, and 15 cm, and the other has a side of 6 cm corresponding to the 9 cm side, find the lengths of the other two sides of the second triangle.

Hint: Use the ratio of the sides to find the missing lengths.

> **The lengths of the other two sides can be found by setting up a proportion based on the corresponding sides.**

Given two similar triangles, where one has sides of 9 cm, 12 cm, and 15 cm, and the other has a side of 6 cm corresponding to the 9 cm side, find the lengths of the other two sides of the second triangle.

Hint: Use the ratio of the sides to find the lengths.

The lengths of the other two sides can be found using the ratio of the corresponding sides.

Which of the following is NOT a valid method to prove two triangles are similar?

Hint: Consider the different criteria for triangle similarity.

- ◯ A) Showing all corresponding angles are equal.
- ◯ B) Showing all corresponding sides are proportional.
- ◯ C) Showing one pair of corresponding angles is equal and the sides around them are proportional.
- ◯ **D) Showing one pair of corresponding sides is equal and the angles around them are equal. ✓**

The method that is NOT valid for proving similarity is showing one pair of corresponding sides is equal and the angles around them are equal.

Part 4: Evaluation and Creation

If two triangles are similar and one has an area of 25 square units while the other has an area of 100 square units, what is the ratio of their corresponding side lengths?

Hint: Consider how the area relates to the side lengths.

- ◯ A) 1:2
- ◯ **B) 1:4 ✓**
- ◯ C) 2:1
- ◯ D) 4:1

The ratio of the corresponding side lengths is the square root of the ratio of their areas.

If two triangles are similar and one has an area of 25 square units while the other has an area of 100 square units, what is the ratio of their corresponding side lengths?

Hint: Consider the relationship between area and side lengths.

- ◯ **A) 1:2 ✓**
- ◯ B) 1:4
- ◯ C) 2:1
- ◯ D) 4:1

The ratio of the corresponding side lengths is the square root of the ratio of their areas.

Evaluate the following scenarios and determine which involve the use of similar triangles:

Hint: Think about practical applications of similar triangles.

- [x] **A) Calculating the height of a tree using a mirror on the ground. ✓**
- [ ] B) Measuring the distance across a river using a rope.
- [x] **C) Designing a scale model of a building. ✓**
- [ ] D) Calculating the area of a triangle using Heron's formula.

> Scenarios involving similar triangles include calculating heights and designing scale models.

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- [x] **C) Designing a scale model of a building. ✓**
- [ ] D) Calculating the area of a triangle using Heron's formula.

> Scenarios that involve similar triangles include calculating heights and designing scale models.

Create a real-world problem that involves similar triangles and provide a step-by-step solution to the problem.

Hint: Think about how similar triangles can be applied in real life.

> **A real-world problem could involve measuring heights or distances using similar triangles.**

Create a real-world problem that involves similar triangles and provide a step-by-step solution to the problem.

Hint: Think about a scenario where you can apply triangle similarity.

A real-world problem could involve measuring heights or distances using similar triangles.