Special Right Triangles Worksheet Questions and Answers PDF

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Part 1: Building a Foundation

What is the side ratio of a 45°-45°-90° triangle?

Hint: Recall the properties of a 45°-45°-90° triangle.

- ◯ A) 1:2:√3
- ◯ **B) 1:1:√2 ✓**
- ◯ C) 1:√3:2
- ◯ D) 1:1:2

> The side ratio of a 45°-45°-90° triangle is 1:1:√2.

Which of the following are properties of a 30°-60°-90° triangle? (Select all that apply)

Hint: Consider the relationships between the sides and angles.

- ☐ **A) The hypotenuse is twice the length of the shortest side. ✓**
- ☐ B) The legs are of equal length.
- ☐ **C) The side opposite the 60° angle is √3 times the shortest side. ✓**
- ☐ **D) The angles are 30°, 60°, and 90°. ✓**

> The properties include that the hypotenuse is twice the length of the shortest side and the side opposite the 60° angle is √3 times the shortest side.

Explain why the 45°-45°-90° triangle is also known as an isosceles right triangle.

Hint: Think about the properties of the angles and sides.

The 45°-45°-90° triangle is known as an isosceles right triangle because it has two equal angles and two equal sides.

List the angles of a 30°-60°-90° triangle and the corresponding side ratios.

Hint: Recall the specific angles and their relationships.

1. What are the angles?

30°, 60°, 90°

2. What are the side ratios?

1:√3:2

The angles are 30°, 60°, and 90° with side ratios of 1:√3:2.

If the leg of a 45°-45°-90° triangle is 5 units, what is the length of the hypotenuse?

Hint: Use the properties of the triangle to find the hypotenuse.

- ◯ **A) 5√2 units ✓**
- ◯ B) 10 units
- ◯ C) 5 units
- ◯ D) 10√2 units

The length of the hypotenuse is 5√2 units.

Part 2: Application and Analysis

A ladder leans against a wall forming a 30° angle with the ground. If the ladder is 10 feet long, how far is the base of the ladder from the wall?

Hint: Consider the properties of a 30°-60°-90° triangle.

- ◯ A) 5 feet
- ◯ **B) 5√3 feet ✓**
- ◯ C) 10 feet
- ◯ D) 10√3 feet

> The base of the ladder is 5√3 feet from the wall.

In a 45°-45°-90° triangle, if one leg measures 7√2 units, what are the possible lengths of the other sides? (Select all that apply)

Hint: Recall the properties of the triangle.

- ☐ **A) 7 units ✓**
- ☐ **B) 7√2 units ✓**
- ☐ C) 14 units
- ☐ D) 14√2 units

> The possible lengths of the other sides are 7 units and 7√2 units.

Given a 30°-60°-90° triangle with a hypotenuse of 16 units, calculate the lengths of the other two sides.

Hint: Use the properties of the triangle to find the lengths.

> **The lengths of the other two sides are 8 units and 8√3 units.**

If a 45°-45°-90° triangle has a hypotenuse of 8√2 units, what is the length of each leg?

Hint: Recall the properties of the triangle to find the leg length.

- ◯ A) 4 units
- ◯ **B) 8 units ✓**
- ◯ C) 4√2 units
- ◯ D) 8√2 units

> The length of each leg is 8 units.

Which of the following transformations can result in a 30°-60°-90° triangle? (Select all that apply)

Hint: Think about how triangles can be formed from other shapes.

- ☐ **A) Cutting an equilateral triangle in half. ✓**
- ☐ B) Bisectin a 45°-45°-90° triangle.
- ☐ **C) Dividing a square diagonally. ✓**
- ☐ D) Splitting a rectangle into two right triangles.

> Cutting an equilateral triangle in half and dividing a square diagonally can result in a 30°-60°-90° triangle.

Part 3: Evaluation and Creation

Which scenario best illustrates the use of a 30°-60°-90° triangle in real life?

Hint: Consider practical applications of this triangle.

- ◯ A) Designing a square garden.
- ◯ **B) Calculating the height of a tree using its shadow. ✓**
- ◯ C) Building a rectangular swimming pool.
- ◯ D) Creating a circular fountain.

> Calculating the height of a tree using its shadow best illustrates the use of a 30°-60°-90° triangle.

You are tasked with designing a triangular park with a 45°-45°-90° shape. Which features should you include to maintain the triangle's properties? (Select all that apply)

Hint: Think about the characteristics of a 45°-45°-90° triangle.

- ☐ **A) Equal length paths for the legs. ✓**
- ☐ **B) A hypotenuse path √2 times longer than the legs. ✓**
- ☐ **C) A right angle at the park's entrance. ✓**

- [ ] D) Unequal length paths for the legs.

> You should include equal length paths for the legs and a hypotenuse path √2 times longer than the legs.

Design a real-world problem that involves a 30°-60°-90° triangle and explain how you would solve it using the triangle's properties.

Hint: Think about practical applications of this triangle.

> **An example could be calculating the height of a building using its shadow and the angle of elevation.**

Analyze how the properties of special right triangles can simplify calculations in geometry problems.

Hint: Consider the advantages of using these triangles.

> **The properties of special right triangles allow for quick calculations and easier problem-solving in various geometric contexts.**