Special Triangles Worksheet Answer Key PDF

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Part 1: Building a Foundation

What is the measure of each angle in an equilateral triangle?

undefined. A) 45 degrees

undefined. B) 60 degrees ✓

undefined. C) 90 degrees

undefined. D) 120 degrees

Each angle in an equilateral triangle measures 60 degrees.

Which of the following are properties of an isosceles triangle?

undefined. A) Two sides are equal ✓

undefined. B) All angles are equal

undefined. C) Base angles are equal ✓

undefined. D) It has a right angle

An isosceles triangle has two equal sides and base angles that are equal.

Explain the Pythagorean theorem and its significance in right triangles.

The Pythagorean theorem states that in a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.

List the side ratios for a 45-45-90 triangle and a 30-60-90 triangle.

1. 45-45-90 triangle side ratios

1:1:√2

2. 30-60-90 triangle side ratios

1:√3:2

The side ratios for a 45-45-90 triangle are 1:1: √2, and for a 30-60-90 triangle, they are 1:√3:2.

Part 2: comprehension and Application

If a triangle has angles measuring 30 degrees, 60 degrees, and 90 degrees, what type of triangle is it?

undefined. A) Equilateral
undefined. B) Isosceles
undefined. C) Right ✓
undefined. D) Scalene

This triangle is a right triangle.

Which statements are true about a 30-60-90 triangle?

undefined. A) The hypotenuse is twice the length of the shorter leg ✓
undefined. B) The longer leg is the same length as the hypotenuse
undefined. C) The longer leg is √3 times the shorter leg ✓
undefined. D) All angles are equal

The hypotenuse is twice the length of the shorter leg, and the longer leg is √3 times the shorter leg.

Describe how the properties of an equilateral triangle can be used to find its area.

The area of an equilateral triangle can be found using the formula A = (√3/4) * s^2, where s is the length of a side.

Given a right triangle with legs measuring 3 cm and 4 cm, what is the length of the hypotenuse?

undefined. A) 5 cm ✓
undefined. B) 6 cm
undefined. C) 7 cm
undefined. D) 8 cm

The length of the hypotenuse is 5 cm.

Which of the following can be used to calculate the area of an isosceles triangle?

undefined. A) Base and height ✓

undefined. B) Two equal sides and the angle between them ✓

undefined. C) All three sides

undefined. D) Perimeter

The area of an isosceles triangle can be calculated using the base and height or two equal sides and the angle between them.

Calculate the height of an equilateral triangle with a side length of 10 cm.

The height of an equilateral triangle with a side length of 10 cm is approximately 8.66 cm.

Part 3: Analysis, Evaluation, and Creation

Which triangle has the property that the square of the hypotenuse is equal to the sum of the squares of the other two sides?

undefined. A) Equilateral

undefined. B) Isosceles

undefined. C) Right ✓

undefined. D) Scalene

This property is characteristic of right triangles.

Identify the correct relationships in a 45-45-90 triangle.

undefined. A) The legs are equal ✓

undefined. B) The hypotenuse is √2 times the length of a leg ✓

undefined. C) All angles are 45 degrees ✓

undefined. D) The hypotenuse is equal to one of the legs

In a 45-45-90 triangle, the legs are equal, and the hypotenuse is √2 times the length of a leg.

Analyze how changing the length of one side of an isosceles triangle affects its angles.

Changing the length of one side of an isosceles triangle affects the angles opposite to the sides, maintaining the property that the two base angles remain equal.

Which triangle type is most efficient for maximizing area given a fixed perimeter?

undefined. A) Equilateral ✓

undefined. B) Isosceles

undefined. C) Right

undefined. D) Scalene

The equilateral triangle is the most efficient for maximizing area given a fixed perimeter.

Which of the following scenarios demonstrate the use of special triangles in real-world applications?

undefined. A) Designing a triangular park ✓

undefined. B) Calculating the height of a building using its shadow ✓

undefined. C) ConstructING a roof with equal slopes ✓

undefined. D) Estimating the distance across a river ✓

All listed scenarios demonstrate the use of special triangles in real-world applications.

Design a real-world problem that involves a 30-60-90 triangle and explain how you would solve it.

A real-world problem could involve determining the height of a tree using the shadow it casts, applying the properties of a 30-60-90 triangle.