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Exterior Angle Theorem Worksheet Questions and Answers PDF

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Part 1: Building a Foundation

What does the Exterior Angle Theorem state?

Hint: Think about the relationship between exterior and interior angles.

◯ A) The exterior angle is equal to the adjacent interior angle.

◯ **B) The exterior angle is equal to the sum of the two non-adjacent interior angles. ✓**

◯ C) The exterior angle is equal to the difference between the two non-adjacent interior angles.

◯ D) The exterior angle is equal to the sum of all interior angles.

> The Exterior Angle Theorem states that the exterior angle is equal to the sum of the two non-adjacent interior angles.

Which of the following are true about triangles?

Hint: Consider the properties of triangles and their angles.

☐ **A) The sum of the interior angles is 180 degrees. ✓**

☐ **B) A triangle can have more than one exterior angle at each vertex. ✓**

☐ **C) The exterior angle is always greater than either of the non-adjacent interior angles. ✓**

☐ **D) The sum of an exterior angle and its adjacent interior angle is 180 degrees. ✓**

> The true statements about triangles include the sum of interior angles being 180 degrees and the relationship between exterior and interior angles.

Explain in your own words why the sum of the interior angles of a triangle is always 180 degrees.

Hint: Consider the properties of parallel lines and transversals.

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> **The sum of the interior angles of a triangle is always 180 degrees due to the properties of Euclidean geometry.**

List the steps to calculate an exterior angle of a triangle when given two interior angles.

Hint: Think about how the angles relate to each other.

1. Step 1

> Identify the two non-adjacent interior angles.

2. Step 2

> Add the two angles together.

3. Step 3

> The sum is the measure of the exterior angle.

> To calculate an exterior angle, add the two non-adjacent interior angles together.

Part 2: Application and Analysis

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If one interior angle of a triangle is 50 degrees and another is 60 degrees, what is the measure of the exterior angle at the third vertex?

Hint: Use the Exterior Angle Theorem to find the answer.

◯ A) 70 degrees

◯ B) 110 degrees

◯ **C) 130 degrees** ✔

◯ D) 90 degrees

> The measure of the exterior angle at the third vertex is 130 degrees.

Given a triangle with angles x, y, and z, where z is the exterior angle, which equations can be used to find z?

Hint: Consider the relationships between the angles.

☐ **A) z = x + y** ✔

☐ B) z = 180 - (x + y)

☐ C) z = 180 - x

☐ D) z = 180 - y

> The correct equations to find z include z = x + y.

A triangle has an exterior angle of 120 degrees. If one of the non-adjacent interior angles is 45 degrees, find the other non-adjacent interior angle. Show your work.

Hint: Use the Exterior Angle Theorem to find the answer.

> **The other non-adjacent interior angle is 75 degrees, calculated by subtractively using the exterior angle.**

In a triangle, if one exterior angle is twice the measure of one of the non-adjacent interior angles, and the other non-adjacent interior angle is 40 degrees, what is the measure of the exterior angle?

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Hint: Set up an equation based on the relationships between the angles.

◯ A) 80 degrees
◯ B) 100 degrees
◯ **C) 120 degrees** ✓
◯ D) 140 degrees

| The measure of the exterior angle is 120 degrees.

Given a triangle with an exterior angle of 150 degrees and one non-adjacent interior angle of 70 degrees, analyze and find the other non-adjacent interior angle. Explain your reasoning.

Hint: Use the Exterior Angle Theorem to find the answer.

The other non-adjacent interior angle is 80 degrees, calculated by subtractively using the exterior angle.

Part 3: Evaluation and Creation

Evaluate the following statement: "The Exterior Angle Theorem can be used to determine the type of triangle (acute, right, obtuse) based solely on its exterior angles."

Hint: Consider the properties of triangle types and their angles.

◯ A) True
◯ **B) False** ✓
◯ C) Not enough information
◯ D) Depends on the angles

| The statement is false; the Exterior Angle Theorem does not determine triangle types solely based on exterior angles.

Consider a triangle with exterior angles measuring 120 degrees, 110 degrees, and 130 degrees. Evaluate which of the following statements are true.

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Hint: Think about the properties of triangles and their angles.

☐ **A) The triangle is scalene.** ✓
☐ B) The triangle is isosceles.
☐ C) The triangle is equilateral.
☐ **D) The triangle is obtuse.** ✓

The true statement is that the triangle is scalene and obtuse.

Create a real-world problem involving the Exterior Angle Theorem and provide a solution. Explain how the theorem is applied in your scenario.

Hint: Think about practical applications of geometry.

A real-world problem could involve architecture or construction where angles need to be calculated.

Propose a method to verify the Exterior Angle Theorem using a geometric construction. List the steps and tools required.

Hint: Consider using a compass and straightedge.

1. Step 1

Draw a triangle using a straightedge.

2. Step 2

Extend one side to create an exterior angle.

3. Step 3

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Measure the angles and verify the theorem.

A method to verify the theorem could involve constructing a triangle and measuring angles.