Exterior Angle Theorem Worksheet

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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.

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.

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.

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

2. Step 2

3. Step 3

Part 2: Application and Analysis

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

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

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.

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?

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

- ◯ A) 80 degrees
- ◯ B) 100 degrees
- ◯ C) 120 degrees
- ◯ D) 140 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.

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

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

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.

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.

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

2. Step 2

3. Step 3