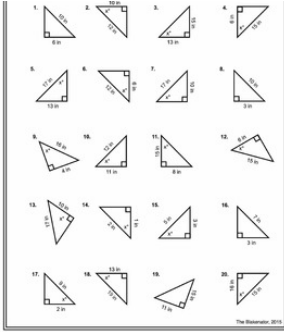


Name _____



Triumphant Triangulation: Navigating Oblique Triangles with Trigonometry

Welcome to the world of oblique triangles, where angles are acute or obtuse, and sides come together in a non-right angle formation. In this adventure, we'll discover how to use trigonometric functions to solve the mysteries of these fascinating triangles.

Imagine you're exploring a mountainous terrain, and you come across a river cutting through the landscape, forming an oblique triangle. You need to determine the distance across the river, but you only have information about the angles and sides of the triangle. This is where trigonometry comes to your rescue.

To solve oblique triangles, we rely on the fundamental principles of trigonometry—sine, cosine, and tangent. These functions allow us to relate the angles of a triangle to the lengths of its sides, even when the triangle is not a right triangle.

Let's say you know the measures of two angles and the length of one side of the triangle. Using the law of sines or the law of cosines, you can determine the lengths of the other sides of the triangle. The law of sines states that the ratio of the length of a side to the sine of its opposite angle is constant for all three sides of the triangle. Similarly, the law of cosines relates the lengths of the sides to the cosine of one of the angles.

For example, if you know the measures of angles A and B and the length of side c, you can use the law of cosines to find the lengths of sides a and b:

$$c^2 = a^2 + b^2 - 2ab \times \cos(C)$$

Once you have the lengths of all three sides, you can use trigonometric functions to find the remaining angles of the triangle. For instance, you can use the sine or cosine function to find angle C:

$$\sin(C) = a/c$$

$$\cos(C) = b/c$$

By applying these trigonometric principles, you can solve a variety of real-world problems involving oblique triangles, from navigation and surveying to engineering and physics. Whether you're exploring the wilderness or designing a bridge, trigonometry empowers you to navigate the complexities of oblique triangles with confidence and precision.

