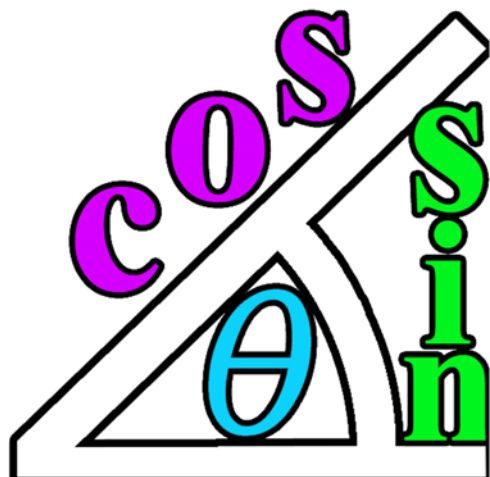


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Triumphant Trigonometric Toolbox: Unveiling the Six Functions

Welcome to the world of trigonometry, where we'll explore the six trigonometric functions that form the backbone of this fascinating branch of mathematics. These functions—sine, cosine, tangent, cosecant, secant, and cotangent—play essential roles in solving all sorts of real-world problems. Let's dive in and discover what each function represents and how it's defined!

First up, we have sine, often abbreviated as \sin . Sine is defined as the ratio of the length of the side opposite an acute angle in a right triangle to the length of the hypotenuse. In simpler terms, it tells us the relationship between the angle of a triangle and the ratio of the side opposite that angle to the hypotenuse.

Next, we have cosine, abbreviated as \cos . Cosine is defined as the ratio of the length of the adjacent side to the length of the hypotenuse in a right triangle. Like sine, cosine helps us understand the relationship between an angle in a triangle and the lengths of its sides.

Then there's tangent, abbreviated as \tan . Tangent is defined as the ratio of the length of the side opposite an acute angle to the length of the adjacent side in a right triangle. Tangent tells us the relationship between the angle of a triangle and the ratio of the side opposite that angle to the adjacent side.

Moving on, we have cosecant, abbreviated as \csc . Cosecant is defined as the reciprocal of the sine function. In other words, it's the inverse of sine, representing the ratio of the hypotenuse to the side opposite an acute angle in a right triangle.

Next, we have secant, abbreviated as \sec . Secant is defined as the reciprocal of the cosine function. It represents the ratio of the hypotenuse to the adjacent side in a right triangle, making it the inverse of cosine.

Finally, there's cotangent, abbreviated as \cot . Cotangent is defined as the reciprocal of the tangent function. It represents the ratio of the adjacent side to the side opposite an acute angle in a right triangle, making it the inverse of tangent.

These six trigonometric functions form the foundation of trigonometry, helping us solve problems involving angles, distances, and shapes. By understanding their definitions and properties, we gain powerful tools for tackling all sorts of mathematical challenges.