

TRIGONOMETRIC FUNCTIONS OF THE ANGLE A - trigonometric because they involve the sides of a triangle, functions of angle A because their values depend on the value of angle A. We name them as follows:

$$\frac{\text{SIDE OPPOSITE}}{\text{HYPOTENUSE}} = \frac{CB}{AB} = \text{SINE OF } A, \text{ written } \sin A.$$

$$\frac{\text{SIDE ADJACENT}}{\text{HYPOTENUSE}} = \frac{AC}{AB} = \text{COSINE OF } A, \text{ written } \cos A.$$

$$\frac{\text{SIDE OPPOSITE}}{\text{SIDE ADJACENT}} = \frac{CB}{AC} = \text{TANGENT OF } A, \text{ written } \tan A.$$



If we wished to list the trigonometric functions of angle B, we rename the sides of the right triangle with reference to B, as in figure 6. Then we find that $\sin B = AC/AB$, $\cos B = CB/AB$, and $\tan B = AC/CB$. Notice that the sine of A and the cosine of B are the same; likewise, the cosine of A and the sine of B are the same. Since A and B are acute angles of a right triangle, their sum is a right angle, and they are said to be complementary. The "cosine" implies "complement's sine", i.e., the cosine of B is the sine of the complement of B, and vice versa.

It is possible, of course, to write three other ratios between the three sides of a right triangle taken in pairs. However, since ~~these would~~ ^{these would} be merely reciprocals of the ones already named, we mention them only for the convenience of the reader who may meet with them elsewhere. The additional functions are called cotangent, secant, and cosecant and are, respectively, the reciprocals of the tangent, cosine and sine.

58. VARIATIONS OF THE VALUES OF TRIGONOMETRIC FUNCTIONS.

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The variations in the values of the trigonometric functions of an angle which occur with changes in the angle can be demonstrated by placing the right triangle in a circle