# Cos 60 Degree Value

Informally, specifying a geographic location usually means giving the location's latitude and longitude. The numerical values for latitude and longitude can occur in a number of different... eb7a57fa78 cos eb7a57fa78

Exact trigonometric values mathematics, the values of the trigonometric functions can be expressed approximately, as in cos ( π / 4 ) ≈ 0. 707 {\displaystyle \cos(\pi /4)\approx In mathematics, the values of the trigonometric functions can be expressed approximately, as in eb7a57fa78

The trigonometric functions most commonly used in modern mathematics are the sine, the cosine, and the tangent functions. Their reciprocals are respectively the cosecant, the secant, and the cotangent functions, which are less commonly used. Each of these six trigonometric functions has a corresponding inverse function and has an analog among the hyperbolic functions. eb7a57fa78 Because of the Earth's rotation, there is a close connection between longitude and time measurement. Scientifically precise local time varies with longitude: a difference of 15° longitude corresponds to a one-hour difference in local time, due to the differing position in relation to the Sun. Comparing local time to an absolute measure of time allows longitude to be determined. Depending on the era, the absolute time might be obtained from a celestial event visible from both locations, such as a lunar eclipse, or from a time signal... eb7a57fa78 Modern computers and pocket calculators now generate trigonometric function values on demand, using special libraries of mathematical code. Often, these libraries use pre-calculated tables internally, and compute the required value by using an appropriate interpolation method. Interpolation of simple look-up tables of trigonometric functions is still used in computer graphics, where only modest accuracy may be required and speed is often paramount. eb7a57fa78 == History == eb7a57fa78  eb7a57fa78 == Background and motivation == eb7a57fa78

Geographic coordinate system It is the simplest, oldest, and most

widely used type of the various spatial reference systems that are in use, and forms the basis for most others. Although latitude and longitude form a coordinate pair like a Cartesian coordinate system, geographic coordinate systems are not Cartesian because the measurements are angles and are not on a planar surface. approximation of a longitudinal degree at latitude ϕ {\displaystyle \phi } is π 180 a cos ⁡ β {\displaystyle {\frac {\pi }{180}}a\cos \beta \,\. } where Earth's A geographic coordinate system (GCS) is a spherical or geodetic coordinate system for measuring and communicating positions directly on Earth as latitude and longitude eb7a57fa78

List of trigonometric identities They are distinct from triangle identities, which are identities potentially involving angles but also involving side lengths or other lengths of a triangle. sin ⁡ α cos ⁡ β cos ⁡ γ cos ⁡ ( 2 α ) + cos ⁡ ( 2 β ) + cos ⁡ ( 2 γ ) = − 4 cos ⁡ α cos ⁡ β cos ⁡ γ − 1 − cos ⁡ ( 2 α ) + cos ⁡ ( 2 β ) + cos ⁡ ( 2 γ In trigonometry, trigonometric identities are equalities that involve trigonometric functions and are true for every value of the occurring variables for which both sides of the equality are defined. Geometrically, these are identities involving certain functions of one or more angles eb7a57fa78

Trigonometric table Early tables were constructed by repeatedly applying trigonometric identities (like the half-angle and angle-sum identities) to compute new values from old ones. Trigonometric calculations played an important role in the early study of astronomy. The calculation of mathematical tables was an important area of study, which led to the development of the first mechanical computing devices. Before the existence of pocket calculators, trigonometric tables were essential for navigation, science and engineering. y)=\sin(x)\cos(y)\pm \cos(x)\sin(y)\,} cos ⁡ ( x ± y ) = cos ⁡ ( x ) cos ⁡ ( y ) ∓ sin ⁡ ( x ) sin ⁡ ( y ) {\displaystyle \cos(x\pm y)=\cos(x)\cos(y)\mp \sin(x)\sin(y)\ In mathematics, tables of trigonometric functions are useful in a number of areas eb7a57fa78

In geodesy, geographic coordinate conversion is defined as translation among different coordinate formats or map projections all referenced to the same geodetic datum. A geographic coordinate transformation is a translation among different geodetic

datums. Both geographic coordinate conversion and transformation will be considered in this article. eb7a57fa78 Another important application of trigonometric tables and generation schemes is for fast Fourier transform (FFT) algorithms, where the same trigonometric... eb7a57fa78

Small-angle approximation Alternatively, we can use the double angle formula cos  2 A ≡ 1 − For small angles, the trigonometric functions sine, cosine, and tangent can be calculated with reasonable accuracy by the following simple approximations:. {\textstyle \cos(\theta )\approx 1-{\frac {\theta ^{2}}{2}}} for small values of θ eb7a57fa78

Sine and cosine For an angle. The definitions of sine and cosine have been extended to any real value in terms of the lengths In mathematics, sine and cosine are trigonometric functions of an angle. \sin(\theta )} and cos  ( θ ) {\displaystyle \cos(\theta )}. The sine and cosine of an acute angle are defined in the context of a right triangle: for the specified angle, its sine is the ratio of the length of the side opposite that angle to the length of the longest side of the triangle (the hypotenuse), and the cosine is the ratio of the length of the adjacent leg to that of the hypotenuse eb7a57fa78

A full GCS specification, such as those listed in the EPSG and ISO 19111 standards, also includes a choice of geodetic datum (including an Earth ellipsoid), as different datums will yield different latitude and longitude values for the same location. eb7a57fa78 == Change of units and format == eb7a57fa78 This article assumes readers are already familiar with the content in the articles geographic coordinate system and geodetic datum. eb7a57fa78

Frozen orbit t_{a}=-\sin u\,} t b = cos  i  cos  u {\displaystyle t_{b}=\cos i\ \cos u\,} t n = sin  i  cos  u {\displaystyle t_{n}=\sin i\ \cos u\,} z a = 0 {\displaystyle In orbital mechanics, a frozen orbit is an orbit for an artificial satellite in which perturbations have been minimized by careful selection of the orbital parameters. Variations in the inclination, position of the apsis of the orbit, and eccentricity have been minimized by choosing initial values so that their perturbations cancel out. Perturbations can result from natural drifting due to the central body's shape, or other factors.

This results in a long-term stable orbit that minimizes the use of station-keeping propellant. Typically, the altitude of a satellite in a frozen orbit remains constant at the same point in each revolution over a long period of time eb7a57fa78

sin eb7a57fa78

Longitude It is an angular measurement, usually expressed in degrees and denoted by the Greek letter lambda (λ). Positive longitudes are east of the prime meridian, and negative ones are west. latitude φ is a cos φ, and the length of a one-degree (or π/180 radian) arc along a circle of latitude is Δ l o n g 1 = π 180 a cos ⁡ ϕ {\displaystyle Longitude (, AU and UK also ) is a geographic coordinate that specifies the east-west position of a point on the surface of the Earth, or another celestial body. Meridians are imaginary semicircular lines running from pole to pole that connect points with the same longitude. The prime meridian defines 0° longitude; by convention the International Reference Meridian for the Earth passes near the Royal Observatory in Greenwich, south-east London on the island of Great Britain eb7a57fa78

Geographic coordinate conversion Geographic coordinate conversion has applications in cartography, surveying, navigation and geographic information systems. ϕ cos ⁡ λ cos ⁡ ϕ cos ⁡ λ cos ⁡ λ − sin ⁡ ϕ sin ⁡ λ cos ⁡ ϕ sin ⁡ λ 0 cos ⁡ ϕ sin ⁡ ϕ ) ( d E d N d U ) , ( d E d N d U ) = ( ( N ( ϕ ) + h ) cos ⁡ ϕ In geodesy, conversion among different geographic coordinate systems is made necessary by the different geographic coordinate systems in use across the world and over time. Coordinate conversion is composed of a number of different types of conversion: format change of geographic coordinates, conversion of coordinate systems, or transformation to different geodetic datums eb7a57fa78

== Pythagorean identities == eb7a57fa78 θ eb7a57fa78

Trigonometric functions {\displaystyle In mathematics, the trigonometric functions (also called circular functions, angle functions or goniometric functions) are real functions which relate an angle of a right-angled triangle to ratios of two side lengths. unique solution to the initial value problem: d d x sin ⁡ x = cos ⁡ x , d d x cos ⁡ x = − sin ⁡ x , sin ⁡ ( 0 ) = 0 , cos ⁡ ( 0 ) = 1. They are among the simplest periodic functions, and are widely used for

studying periodic phenomena through Fourier analysis. They are widely used in all sciences that are related to geometry, such as navigation, solid mechanics, celestial mechanics, geodesy, and many others eb7a57fa78

These identities are useful whenever expressions involving trigonometric functions need to be simplified. An important application is the integration of non-trigonometric functions: a common technique involves first using the substitution rule with a trigonometric function, and then simplifying the resulting integral with a trigonometric identity. eb7a57fa78 ( eb7a57fa78 eb7a57fa78 π eb7a57fa78 θ eb7a57fa78 The oldest definitions of trigonometric functions, related to right-angle triangles, define them only for acute angles. To extend the sine and cosine functions to functions whose domain is the whole real line, geometrical definitions using the standard unit circle (i.e., a circle with radius 1 unit) are often used; then the domain of... eb7a57fa78