# Cartesian Coordinate Systems

Once the radius is fixed, the three coordinates (r, θ, φ), known as a 3-tuple, provide a coordinate system on a sphere, typically called the spherical polar coordinates. b7cdb21120 The most familiar coordinate systems are the two-dimensional and three-dimensional Cartesian coordinate systems. Cartesian tensors may be used with any Euclidean space, or more technically, any finite-dimensional vector space over the field of real numbers that has an inner product. b7cdb21120

Cartesian category theory Cartesian coordinate system, modern rectangular coordinate system Cartesian diagram, a construction in category theory Cartesian geometry, now Cartesian means of or relating to the French philosopher René Descartes—from his Latinized name Cartesius. It may refer to: b7cdb21120

Polar coordinates are most appropriate in any context where the phenomenon being considered is inherently tied to direction and length from a center point in a plane, such as spirals. Planar physical systems with bodies moving around a central... b7cdb21120 the point's direction from the pole relative to the direction of the polar axis, a ray drawn from the pole. b7cdb21120 the azimuthal angle φ, which is the angle of rotation of the radial line around the polar axis. b7cdb21120 This article tries to give an overview of several coordinate systems in use for the two-dimensional hyperbolic plane. b7cdb21120

State Plane Coordinate System state contains one or more state plane zones, the boundaries of which usually follow county lines. The system is widely used for geographic data by state and local governments. Each U. First, it uses a simple Cartesian coordinate system to specify locations rather than a more complex spherical coordinate system (the geographic coordinate system of latitude and longitude). S. There are 108 zones in the contiguous United States, with 10 more in Alaska, five in Hawaii, one for Puerto Rico and the United States Virgin Islands, and one for Guam. Its popularity is due to at least two factors. By using the Cartesian coordinate system's simple XY coordinates. simple Cartesian coordinate system to specify locations rather than a more complex spherical coordinate system (the geographic coordinate system of latitude The State Plane Coordinate System (SPCS) is a set of 125 geographic zones or coordinate systems designed for specific regions of the United States b7cdb21120

Spherical coordinate system These are. And these systems of the In mathematics, a spherical coordinate system specifies a given point in three-dimensional space by using a distance and two angles as its three coordinates. spherical coordinate systems used in mathematics normally use radians rather than degrees; (note 90 degrees equals π⁄2 radians) b7cdb21120

Similarly, the position of any point in three-dimensional space can be specified by three Cartesian coordinates, which are the signed distances from the point to three mutually perpendicular planes. More generally, n Cartesian coordinates... b7cdb21120

Polar coordinate system Polar coordinates are most appropriate in any context where In mathematics, the polar coordinate system specifies a given point in a plane by using a distance and an angle as its two coordinates. These are. angle, or azimuth. The pole is analogous to the origin in a Cartesian coordinate system b7cdb21120

Cartesian coordinate robot A Cartesian coordinate robot (also called linear robot) is an industrial robot whose three principal axes of control are linear (i. they move in a straight line rather than rotate) and are at right angles to each other. As a robot coordinate system, it is also effective for horizontal travel and for stacking bins. e. It has high reliability and precision when operating in three-dimensional space. The three sliding joints correspond to moving the wrist up-down, in-out, back-forth. Among other advantages, this mechanical arrangement simplifies the robot control arm solution. e. they move in a straight A Cartesian coordinate robot (also called linear robot) is an industrial robot whose three principal axes of control are linear (i b7cdb21120

(See graphic regarding the "physics convention".) b7cdb21120

Cartesian coordinate system The axes directions represent an orthogonal basis. The point where the axes meet is called the origin and has (0, 0) as coordinates. In geometry, a Cartesian coordinate system (UK: /kɑːrˈtiːzjən/, US: /kɑːrˈtiːʒən/) in a plane is a coordinate system that specifies each point uniquely In geometry, a Cartesian coordinate system (UK: , US: ) in a plane is a coordinate system that specifies each point uniquely by a pair of real numbers called coordinates, which are the signed distances to the point from two fixed perpendicular oriented lines, called coordinate lines, coordinate axes or just axes (plural of axis) of the system. The combination of origin and basis forms a coordinate frame called the Cartesian frame b7cdb21120

Coordinate systems for the hyperbolic plane Several qualitatively different ways of coordinatizing the plane in hyperbolic geometry are used. Like in the Cartesian coordinate system, the coordinates are found by dropping perpendiculars from the In the hyperbolic plane, as in the Euclidean plane, each point can be uniquely identified by two real numbers. perpendicular to the x-axis through the origin b7cdb21120

In the descriptions below the constant Gaussian curvature of the plane is −1. Sinh, cosh and tanh are hyperbolic functions. b7cdb21120 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. b7cdb21120 Use of Cartesian tensors occurs in physics and engineering, such as with the Cauchy stress tensor and the moment of inertia tensor in rigid body dynamics. Sometimes general curvilinear coordinates are convenient, as in high-deformation continuum mechanics, or... b7cdb21120

Coordinate system unique coordinate and each real number is the coordinate of a unique point. The coordinates are taken to be real numbers in elementary mathematics, but may be complex numbers or elements of a more abstract system such as a commutative ring. The prototypical example of a coordinate system is the Cartesian coordinate system In geometry, a coordinate system is a system that uses one or more numbers, or coordinates, to uniquely determine and standardize the position of the points or other geometric elements on a manifold such as Euclidean space. The use of a coordinate system allows problems in geometry to be translated into problems about numbers and vice versa; this is the basis of analytic geometry. The coordinates are not interchangeable; they are commonly distinguished by their position in an ordered tuple, or by a label, such as in "the x-coordinate" b7cdb21120

Geographic coordinate system Although latitude and longitude form a coordinate tuple like a cartesian coordinate system, geographic coordinate systems are not cartesian because the measurements are angles and are not on a planar surface. a coordinate tuple like a cartesian coordinate system, geographic coordinate systems are not cartesian because the measurements are angles and are not A geographic coordinate system (GCS) is a spherical or geodetic coordinate system for measuring and communicating positions directly on Earth as latitude and longitude. 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 b7cdb21120

the radial distance r along the line connecting the point to a fixed point called the origin; b7cdb21120 the polar angle θ between this radial line and a given polar axis; and b7cdb21120 The distance from the pole is called the radial coordinate, radial distance or simply radius, and the angle is called the angular coordinate, polar angle, or azimuth. The pole is analogous to the origin in a Cartesian coordinate system. b7cdb21120

Cartesian tensor The most familiar coordinate systems are the two-dimensional and three-dimensional Cartesian coordinate systems. Converting a tensor's components from one such basis to another is done through an orthogonal transformation. transformation. Cartesian tensors may be used with In geometry and linear algebra, a Cartesian tensor uses an orthonormal basis to represent a tensor in a Euclidean space in the form of components b7cdb21120

the point's distance from a reference point called the pole, and b7cdb21120 The plane passing through the origin and perpendicular to the polar axis (where the polar angle is a right angle) is called the reference plane (sometimes... b7cdb21120