Topic Page: Altitude

Definition: **altitude** from *The Penguin Dictionary of Mathematics*

1.

A line segment, or the length of a line segment, giving the height of a polygon, polyhedron, cone, cylinder, or other geometric figure. It is the distance between the bases of the figure (e.g. in a prism) or the distance from the base to the vertex (e.g. in a pyramid).

2.

Symbol: *h*. The angular distance of a point on the celestial sphere from the horizon taken along a great circle passing through the zenith, the point, and the nadir. Altitude is measured from 0° to 90° north (taken as positive) or south (taken as negative) of the ecliptic. Sometimes its complement, the zenith distance, is used. *See* horizontal coordinate system.

Image from: **The curious relationship between altitude and suicide** in *The Conversation: An Independent Source of Analysis from Academic Researchers*

Summary Article: **Altitude**
from *Encyclopedia of Geography*

Altitude is the distance between a position and a vertical reference surface. Distance might be measured in angular or length units. The position might be the point location of an object or a specified point along a vehicle track or satellite orbit. The surface might be one of many vertical datums, such as the center of the Earth, the surface of the ocean, the topographic surface of the Earth, the top of the built environment, or a constant barometric pressure surface.

The precise distance between a surface and a position depends on the definition of the line between them. For example, the line might be perpendicular to a plane tangent to the reference surface, or it might extend from the position toward the center of the mass of the Earth.

The terms *altitude, elevation*, and *height* are sometimes used interchangeably. In different contexts, these words take on different meanings, and the modifiers attached to them can sometimes clarify their usage. *Elevation* is often associated with the distance from a defined surface, such as the geoid, the theoretical equipotential gravity surface of the Earth, or a physically defined gravity surface model, such as a specific mean-sea-level datum, or with respect to the actual local-level plane as measured at the position. *Height* is sometimes reserved for the distance between a reference ellipsoid and a position or for the distance from the bottom to the top of an entity, such as a building or a mountain peak. The height of an aircraft might be the distance above the topographic surface of the Earth, while the height of a geodetic survey monument might be its vertical distance from a reference ellipsoid.

This sentence appears in a text on surveying principles: “Therefore, the altitude at which the plane must fly is calculated by adding the elevation of the mean datum to the flying height.” The *altitude* of the aircraft is above mean sea level, the flying *height* is the distance between the aircraft and the ground, and the ground (the mean datum) has an *elevation* with respect to mean sea level.

Altitude is modified by words that further specify the meaning. *Absolute altitude* refers to the

distance above the physical surface of the sea or land. Angular *altitude* is the vertical angle between some plane (such as local level) and a line from the observation point to an object such as a mark on a surveyor's rod or a star. *Barometric altitude* is the distance from one constant pressure surface (an isobaric surface) to another. *Meridian altitude* is the vertical angle to an object measured along a line of longitude.

See also

Datums, Geodesy, Latitude, Longitude, Surveying

Further Readings

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- National Geodetic Survey. (1986). Geodetic glossary. Rockville, MD: National Geodetic Information Center, Charting and Geodetic Services, National Ocean Service, National Oceanic and Atmospheric Administration.

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