The **Haversine** formula calculates the shortest distance between two points on a sphere using their latitudes and longitudes measured along the surface. It is important for use in navigation. The haversine can be expressed in trigonometric function as: 

The haversine of the central angle (which is d/r) is calculated by the following formula:



where r is the radius of the earth(6371 km), d is the distance between two points,  is the latitude of the two points, and  is the longitude of the two points respectively.  
Solving d by applying the inverse haversine or by using the inverse sine function, we get: 



or

  
The distance between Big Ben in London (51.5007° N, 0.1246° W) and The Statue of Liberty in   
New York (40.6892° N, 74.0445° W) is 5574.8 km. This is not the exact measurement because the   
formula assumes that the Earth is a perfect sphere when in fact it is an oblate spheroid.