

# Geometric Algorithms - GeeksforGeeks

**Source:** <https://www.geeksforgeeks.org/geometric-algorithms/>

Courses Tutorials Practice Jobs DSA Tutorial Interview Questions Quizzes Must Do Advanced DSA System Design Aptitude Puzzles Interview Corner DSA Python Technical Scripter 2026 Explore DSA Fundamentals Logic Building Problems Analysis of Algorithms Data Structures Array Data Structure String in Data Structure Hashing in Data Structure Linked List Data Structure Stack Data Structure Queue Data Structure Tree Data Structure Graph Data Structure Trie Data Structure Algorithms Searching Algorithms Sorting Algorithms Introduction to Recursion Greedy Algorithms Tutorial Graph Algorithms Dynamic Programming or DP Bitwise Algorithms Advanced Segment Tree Binary Indexed Tree or Fenwick Tree Square Root (Sqrt) Decomposition Algorithm Binary Lifting Geometry Interview Preparation Interview Corner GfG160 Practice Problem GeeksforGeeks Practice - Leading Online Coding Platform Problem of The Day - Develop the Habit of Coding DSA Course 90% Refund Geometric Algorithms Last Updated : 26 Jan, 2026 Geometric algorithms are a type of algorithm that deal with solving problems related to geometry. Solve problems involving, distances, intersections, arrangements, and transformations. Used in graphics, computer-aided design, robotics, and geographical information systems. medical imaging, and astronomy for spatial computation and analysis. Popular algorithms include Convex Hull, Closest Pair, Line Intersection, Point-in-Polygon, Sweep Line, Voronoi Diagram, Delaunay Triangulation, and Rotating Calipers. Lines: Mid-point of a line Section formula (Point that divides a line in given ratio) Slope of a line Line passing through 2 Points Intersection of Two Lines Find if any two segments intersect Count maximum points on same line Minimum lines to cover all points Triangle: Check triangle is valid or not Check if a given point lies inside a triangle Area of a triangle Check if right triangle possible from given area and hypotenuse Count Integral points inside a Triangle All angles of a given triangle Circumcenter of a Triangle Triangles formed from a set of lines in Euclidean Plane Area of Circumcircle of an Equilateral Triangle Third side of triangle using law of cosines Rectangle | Square | Circle: Check whether a given point lies inside a rectangle or not Program for Area And Perimeter Of Rectangle Find if two rectangles overlap How to check if given four points form a square Number of rectangles in N\*M grid Program to find Circumference of a Circle Program to find area of a circle Check whether a point exists in circle sector or not Check if two given circles touch or intersect each other Program to find area of a Circular Segment Check if a line touches or intersects a circle Area of a Circumscribed Circle of a Square Find minimum radius such that atleast k point lie inside the circle Angular Sweep (Maximum points that can be enclosed in a circle of given radius) Quadrilateral: Number of parallelograms when n horizontal parallel lines intersect m vertical parallel lines Program for Circumference of a Parallelogram Program to calculate area and perimeter of Trapezium Program to find area of a Trapezoid Find all possible coordinates of parallelogram Maximum area of quadrilateral Check whether four points make a parallelogram Find the Missing Point of Parallelogram 3D Objects: Find the perimeter of a cylinder Program for Volume and Surface area of Frustum of Cone Program to calculate volume of Ellipsoid Program for volume of Pyramid Calculate volume and surface area of a cone Calculate Volume and Surface area Of Sphere Program for Volume and Surface Area of Cuboid Program for Volume and Surface Area of Cube Pythagorean Quadruple LS3/NS3 sphere generation algorithm and its implementation Polygon and Convex Hull: How to check if a given point lies inside or outside a polygon? Area of a polygon with given n ordered vertices Tangents between two Convex Polygons Find number of diagonals in n sided convex polygon Convex Hull using Jarvis' Algorithm or Wrapping Quickhull Algorithm for Convex Hull Deleting points from Convex Hull Minimum area of a Polygon with three points given Standard Problems on Geometric Algorithm: Finding the vertex, focus and directrix of a parabola Find Simple Closed Path for a given set of points Number of Integral Points between Two Points Optimum location of point to minimize total distance Find perimeter of shapes formed with 1s in binary matrix Draw geometric shapes on images using OpenCV Find if it's possible to rotate the page by an angle or not Equable Shapes Quick Links : Learn Data Structure and Algorithms | DSA Tutorial 'Practice Problems' on Geometric Algorithms Recent Articles on Geometric Algorithms Comment Article Tags: Article Tags: Geometric DSA