Java Geometric Function Library (GeomJLib). Application programming interface (API)

Version 1.0

Shapes 2D

Annulus or Circular Crown

Area

static areaan (double radius1, double radius2)

return double

Perimeter

static perann (double radius1, double radius2)

return double

Arc Sector

Area

static arcarea (double radius, double angle)

return double

Chord

static charc (double radius, double angle)

return double

Length

static arclength (double angle, double radius)

return double

Perimeter

static periarc (double radius, double angle)

return double

Circle

Area

static circarea (double radius)

return double

Circumference from diameter

static circd (double diameter)

return valore

Circumference from radius

static circr (double radius)

return double

Diameter from circumference

static diacircle (double circumference)

return double

Diameter from radius

static diacirc (double radius)

return double

Radius

static radcirc (double circumference)

return double

Circular Sector

angle in degrees

Area

static arcisec (double radius, double angle)

return double

Chord

static chcise (double radius, double angle)

return double

Length of circular arc

static leang (double radius, double angle)

return double

Decagon

Apothem

static decapothem (double radius)

return double

Area

static decarea (double radius)

return double

Side

static decaside (double radius)

return double

Dodecagon

Apothem

static apododec (double radius)

return double

Area

static areadodec (double radius)

return double

Side

static sidedodec (double radius)

return double

Ellipse

semixe: semi axe

Area

static areaellipse (double semixe1, double semixe2)

return double

Distance of focus from the center

static distfocus (double semixe1, double semixe2)

return double

Eccentricity

static ecceell (double semixe1, double semixe2)

return double

Perimeter

static perimell (double semixe1, double semixe2)

return double

Hexagon

Apothem from radius

static apohex (double radius)

return double

Area from radius

static areahex (double radius)

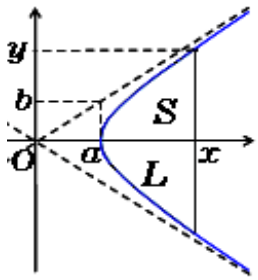
return double

Hyperbolic Sector

Area

static arhys (double b, double x, double a)

return double



Eccentricity

static ehys (double b, double x, double a)

return double

Length

static lhys (double b, double x, double a)

return double

Kite

Area

static double kitar (double diagonal1, double diagonal2)

return double

Area from two different sides and angle in degrees

static double kitaran (double side1, double side2, double angle)

return double

Diagonal

static double kitdi (double diagonal, double area)

return double

Diagonal from sides and height (other diagonal)

static double kitdiag (double side1, double side2, double height)

return double

Perimeter

static double kitper (double side1, double side2)

return double

Side

static double kitsi (double perimeter, double side)

return double

Octagon

Apothem

static octaapo (double radius)

return double

Area

static octarea (double radius)

return double

Side

static octaside (double radius)

return double

Octagram

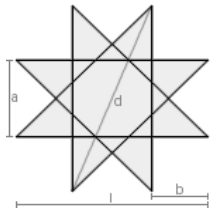
a: edge length octagon

b: spike length

c: chord

d: diagonal

l: chord



Area from chord and spike

static double areaoct (double l, double b)

return double

Area from spike

static double areaoctch (double b)

return double

Chord from edge and spike

static double chordoct (double a, double b)

return double

Chord from edge length octagon

static double chedleoc (double a)

return double

Diagonal

static double diagonal (double a)

return double

Edge length octagon

static double edleoc (double c)

return double

Perimeter

static double perocta (double b)

return double

Spike

static double spike (double c)

return double

Parabolic Arch

Area from and chord

static double areparar (double height, double chord)

return double

Lenght from and chord

static double lepararc (double height, double chord)

return double

Regular Polygon Incircle or Outcircle

nside: number of sides

Apothem from circumradius

static double aprpol (double nside, double circumradius)

return double

Apothem from side and number of sides

static double aprpols (double side, double nside)

return double

Area from side and number of sides

static double arpolsns (double side, double nside)

return double

Area circle inscribed

static arciinpol (double side, double nside)

return double

Area polygon circumscribed

static arpolinpol (double side, double nside, double radius)

return double

Area polygon circumscribed

static arpolinps (double side, double nside)

return double

Area polygon circumscribed

static arpolout (double nside, double side, double radius)

return double

Area polygon inscribed

static arpolin (double nside, double radius)

return double

Radius circle inscribed

static radciinpol (double side, double nside)

return double

Side polygon inscribed

static spoin (double radius, double nside)

return double

Side polygon circumscribed

static spoout (double radius, double nside)

return double

Parallelogram

Base

static baseparall (double area, double height)

return double

Height

static hparal (double area, double side2)

return double

Long diagonal

static diagmajparall (double side2, double side1, double height)

return double

Radius circle circumscribed to polygon

static double radcircp (double side, double apothem)

return double

Smaller diagonal

static diagonalparall (double side2, double side1, double height)

return double

Pentagon

Apothem from radius

static apothempentagon (double radius)

return double

Area from radius

static areapentagon (double radius)

return double

Side from radius

static sidepentagon (double radius)

return double

Quadrilateral Inscribed in a Circle

Area

static aquincir (double side1, double side2, double side3, double side4)

return double

Perimeter

static pequad (double side1, double side2, double side3, double side4)

return double

Quadrilateral

Area (angle in degrees)

static arqua (double side1, double side2, double side3, double side4, double angle1, double angle2)

return double

Rectangle

Area

static arearect (double side1, double side2)

return double

Diagonal of rectangle

static diagonalrec (double side1,double side2)

return double

Perimeter

static perrect (double side1, double side2)

return double

Side from perimeter

static siderect (double perimeter, double side)

return double

Side from diagonal

static siderectdi (double diagonal, double side1)

return double

Side from area and one side

static siderec (double area, double side2)

return double

Regular Polygon

static numberside: number of sides of polygon

sperim: semi perimeter

Apothem (Supported number of sides of polygon: 5-40)

static apothempoligon (double side, int numberside)

return double

Apothem circle circumscribed from side and number of sides

static apopolside (double side, int numside)

return double

Apothem circle circumscribed from radus and number of sides

static apopolradius (double radius, double side, int numside)

return double

Apothem from area and perimeter

static apothem (double area, double perimeter)

return double

Area (Supported number of sides of polygon: 5-40)

static areapoligon (double side, int numberside)

return double

Area from semi perimeter and apothem

static arpol (double sperim, double apothem)

return double

Constant area polygon

static constantareapol (double area, double side)

return double

Perimeter

static perimeterpolreg (double side, int number)

return double

Perimeter from area and apothem

static perimeterpoligon (double area, double apothem)

return double

Radius circle circumscribed

static radiuspol (double side, int numside)

return double

Side from area and Number of sides (Supported number of sides of polygon: 5-40, this function used the constant)

static sidepoligonar (double area, int numberside)

return double

Side from area and Number of sides

static spolreg (double area, double nside)

return double

Side regular polygon from apothem

static sidepoligonapo (double area, int numberside)

return double

Side from area

static sidepoligon (double side, int numberside)

return double

Rhombus

Area

static area (double diagona1, double diagonal2)

return double

Diagonal from side

static diagonalomb (double diagonal1, double side)

return double

Height

static heightromb (double area, double side)

return double

Radius circle inscribed

static radiusrho (double diagonall1, double diagonal2)

return double

Side from diagonal

static sidediag (double diagonal1, double diagonal2)

return double

Side from area and radius

static side (double area, double radius)

return double

Square

Area

static areasqr (double side)

return double

Diagonal from side

static diagsqr (double side)

return double

Diagonal from area

static diagsqrar (double area)

return double

Side from diagonal

static sidesqr (double diagonal)

return double

Trapezoid or Trapezium

base1: long base

base2: smaller base

Area

static areatrap (double base1, double base2, double height)

return double

Base

static basetrapezoid (double diagonal, double height)

return double

Diagonal

static diagtrapret (double side, double height)

return double

Perimeter

static perimetertrap (double base1, double base2, double height, double diagonal)

return double

Isosceles trapezoid

side: inclined side

Area using Pitot's theorem

static aristrp (double base1, double base2, double side)

return double

Diagonal

static diatrapiso (double base1, double base2, double height)

return double

Height

static heighttraiso (double side, double base1, double base2)

return double

Radius circle circumscribed to trapezoid

static double radctr (double base, double diagonal, double side)

return double

Right trapezoid or Right-angled trapezoid

height1: long height

height2: smaller height

Area

static double arigtr (double base, double height1, double height2)

return double

Perimeter

static double perigtr (double base, double height1, double height2)

return double

Radius circle inscribed in rectangle trapezoid

static double rcitr (double base1, double base2)

return double

Triangle

Angle bisector

static bisectortri (double side1, double side2, double side3, double perimeter)

return double

Area

static areatriangle (double side, double height)

return double

Area

static double artrian (double side1, double side2, double side3)

return double

Height from side

static heightri (double side, double area)

return double

Median

static medtri (double side1, double side2, double side3)

return double

Radius circle inscribed

static radiustri (double perimeter, double area)

return double

Equilateral triangle

Height

static heqtri (double side)

return double

Median

static medeqtr (double side1, double side2)

return double

Isosceles triangle

Base

static baseiso (double side, double height)

return double

Height

static heightiso (double side, double base)

return double

Perimeter

static pertriso (double side, double base)

return perimeter

Right triangle

Hypotenuse

static hypotenuse (double side1, double side2)

return double

Perimeter

static perrgtr (double side1, double side2)

return double

Scalene triangle

Area

static areascalene (double side1, double side2, double side3, double perimeter)

return double

Height

static hsctri (double side, double area)

return double

Perimeter

static persctr (double side1, double side2, double side3)

return double

Shapes 3D

Circular Truncated Cone

radius1: smaller radius

radius2: long little

Lateral area

static double lareactc (double radius1, double radius2, double height)

return double

Surface

static double surctc (double radius1, double radius2, double height)

return double

Volume

static double volctc (double radius1, double radius2, double height)

return double

Cone

slength: slant length

latarea: lateral area

Base radius from slant length and lateral area

static double radcon (double latarea, double slength)

return double

Base radius from volume

static double radconv (double volume, double height)

return double

Base area

static double arbcon (double radius)

return double

Height

static double hcon (double volume, double radius)

return double

Lateral area

static double latarcon (double radius, double length)

return double

Lateral length

static double lencon (double latarea, double radius)

return length

Surface

static double surfcon (double radius, double length)

return double

Volume

static double volcon (double radius, double height)

return double

Cube

Area of face

static double arfacub(double side)

return double

Diagonal

static double diacub (double side)

return double

Lateral area

static double arlatcub(double side)

return double

Radius of circumscribed sphere

static double radsci (double side)

return double

Radius of sphere tangent to edges

static double radspta (double side)

return double

Radius of inscribed sphere

static double radcin (double side)

return double

Side from lateral area

static double sidecu (double arlatcub)

return double

Side from surface

static double scube (double surcub)

return double

Side from volume

static double sicuv (double volume)

return double

Surface

static double surcub (double side)

return double

Volume

static double volcu (double side)

return double

Cylinder

Surface

static double scyl (double radius, double height)

return double

Volume

static double volcy (double radius, double height)

return double

Dodecahedron

Surface

static double surdode (double side)

return double

Volume

static double voldode (double side)

return double

Ellipsoid

Surface

static double supell (double radius1, double radius2)

return double

Surface of prolate spheroid (approximate function)

radius1>radius2=radius3

static double supellpr (double radius1, double radius2, double radius3)

return double

Surface of oblate spheroid (approximate function)

radius1=radius2>radius3

static double supellobl (double radius1, double radius3)

return double

Surface of scalene ellipsoid (approximate function that implement the Knud Thomsen function, relative error of at most 1.061%)

radius1>radius2>radius3

static double supellsca (double radius1, double radius2, double radius3)

return double

Volume

static double ellivol (double radius1, double radius2, double radius3)

return double

Ellipsoidal Cap

Area

static double arbelcap (double a, double b, double c, double h)

return double

Volume

static double voelcap (double a, double b, double c, double h)

return double

Frustum

Radius external

static double volfru (double area1, double area2, double height)

return double

Hollow Cylinder

radius1: external radius

radius1: internal radius

Radius external cylinder

static double volhcyl (double radius1, double radius2, double height)

return double

Lateral area

static double larhcyl (double radius1, double radius2, double height)

return double

Surface

static double surrhcyl (double radius1, double radius2, double height)

return double

Hollow Sphere

radin: radius internal sphere

radout: radius out out sphere

diain: diameter internal sphere

diaout: diameter out sphere

Volume from radius

static double vohosp (double radin, double radout)

return double

Volume from diameter

static double vohospdia (double diain, double diaout)

return double

Icosahedron

Surface

static double icosur (double side)

return double

Volume

static double icovol (double side)

return double

Obelisk

Volume

static double volob (double height, double A, double B, double a, double b)

return double

Oblique Circular Cylinder

Lateral area

static double ltarobcy (double radius, double height1, double height2)

return double

Surface

static double supobcy (double radius, double height1, double height2)

return double

Volume

static double volobcy (double radius, double height1, double height2)

return double

Octahedron

Height

return double

Surface

static double superface (double side)

return double

Volume

static double volume (double side)

return double

Paraboloid

a and b: semi-axes of the ellipse at the summit

Volume

static double volparb (double a, double b, double height)

return double

Parallelepiped

Diagonal from diagonal of base and height

static double diaparadb (double diagonalbase, double height)

return double

Diagonal from sides and height

static double diapara (double side1, double side2, double height)

return double

Height from volume and base area

static double hpa (double volume, double areabase)

return double

Height from perimeter and lateral surface

static double hepals (double latarea, double perimeter)

return double

Height from diagonal side and angle (in degrees) side/height

static double hepald (double angle, double side)

return double

Volume

static double volpar (double side1, double side2, double side3)

return double

Partial Circular Cone

Angle of center of base

static double ancirco (double a, double r)

return degrees

Base area

static double areab (double a, double r)

return double

Chord

static double chordco (double a, double r)

return double

Circular arc

static double circarc (double a, double r)

return cirar

Cross-section area

static double areah (double a, double r, double height)

return double

Lateral area

static double areal (double a, double r, double height)

return double

Volume

static double volpcc (double a, double r, double height)

return double

Partial Hemisphere or Spherical Segment

Area upper circle

static double arup (double radius, double height)

return double

Lateral area

static double larpahem (double radius, double height)

return double

Radius upper circle

static double radpahem (double radius, double height)

return radcir

Surface

static double surpahem (double radius, double height)

return double

Volume

static double volpahem (double radius, double height)

return double

Partial Right Cylinder

Base area

static double arbprcy (double radius, double height, double wide)Area Base

return double

Lateral area

static double arlprcy (double radius, double height)

return doublel

Top area

static double arsuprcy (double radius, double height, double wide)

return double

Volume

static double volprcy (double radius, double height, double wide)

return double

Partial Sphere

rbase: radius of bottom

Base area

static double arbpars (double rbase)

return double

Base radius

static double radbpars (double radius, double height)

return double

Surface

static double surpars (double rbase, double height)

return double

Volume

static double volpars (double rbase, double height)

return double

Polyhedron

Constant for radius (Number of Faces of Polyhedron: 4, 6, 8, 12, 20)

static int nfacer (int numface)

return double

Radius circumference inscribed in Polyhedron

static double radin (double volume, double surface)

return double

Radius circumference circumscribed to Polyhedron

static double radout (double volume, double surface, double side, int nface)

return double

Volume polygon 4 faces

static double volpo4 (double side)

return double

Spherical Cap

radiusc: radius of sphere

radius: radius base of spherical cap

Area Base

static double arbspcap (double radius, double height)

return double

Radius of spherical cap

static double radsfcap (double radiusc, double height)

return double

Radius of sphere

static double radsf (double radiussfhere, double height)

return double

Surface

static double surspcap (double radius, double height)

return double

Volume from radius and height

static double volspfcap (double radius, double height)

return double

Sphere

Radius

static double radsp (double surface)

return double

Radius from volume

static double radspv (double volume)

return double

Surface

static double sursp (double radius)

return double

Volume

static double volsp (double radius)

return double

Square Pyramid

slength: Slant Length

Surface

static double susqpyr (double area, double perimeter, double slength)

return double

Volume

static double volsqpyr (double area, double height)

return double

Torus

radius: radius small circle

radiustorus: radius bigger circle

Surface

static double torarea (double radius, double radiustorus)

return double

Volume

static double torvol (double radius, double radiustorus)

return double

Triangular Prism

Surface

static double trparea (double areabase, double height, double perimeter)

return double

Volume

static double trpvol (double areabase, double height)

return double

Triangular Pyramid

Height

static double htrpy (double side)

return double

Surface

static double artrpy (double side)

return double

Volume

static double voltrpy (double side)

return double

Truncated Square Pyramid

a: side base

b: side top

h: height

Lateral area

static double ltatspy (double a, double b, double h)

return double

Surface

static double surtspy (double a, double b, double h)

return double

Volume

static double voltspy (double a, double b)

return double

Wedge

a: long side base

b: small side top

c: side top

Lateral area

static double larwed (double b, double c, double height, double a)

return double

Surface

static double surwed (double b, double c, double height, double a)

return double

Volume

static double volwed (double b, double c, double height, double a)

return double