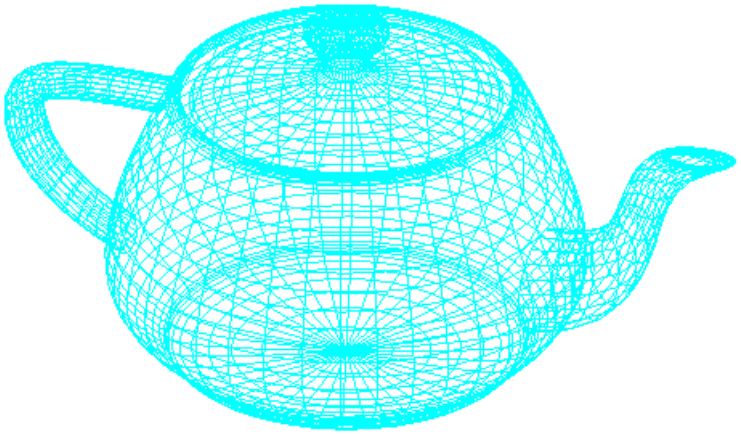
COSC363 Computer Graphics

GLUT, GLU Objects



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GLUT Objects

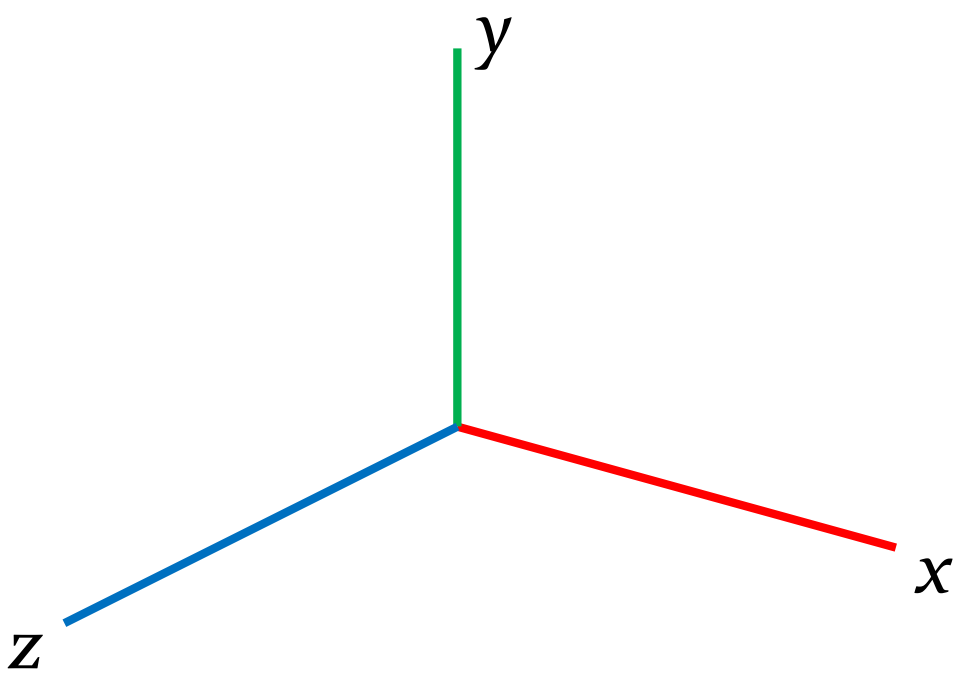
- Sphere
- Torus
- Teapot
- Cone
- Cube
- Tetrahedron
- Octahedron
- Dodecahedron
- Icosahedron

GLU Objects

- Disk
- Cylinder
- Sphere

Axis Notation

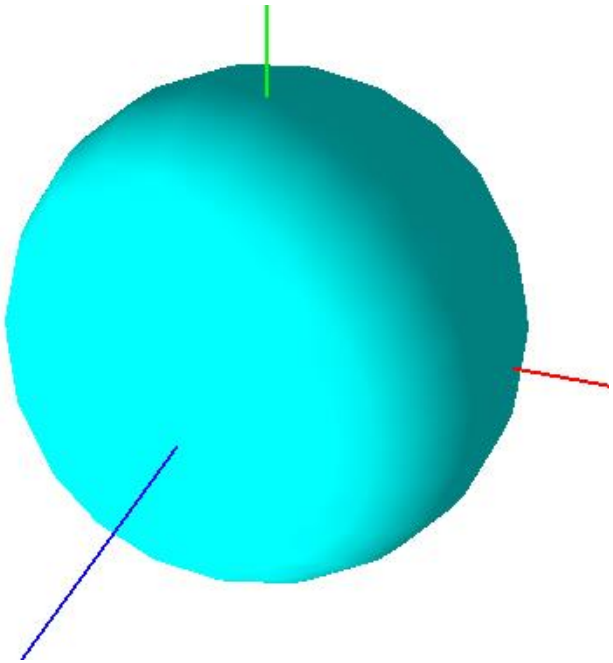
In the following figures, the *x*-axis is indicated by red colour, the *y*-axis by green colour and the *z*-axis by blue.

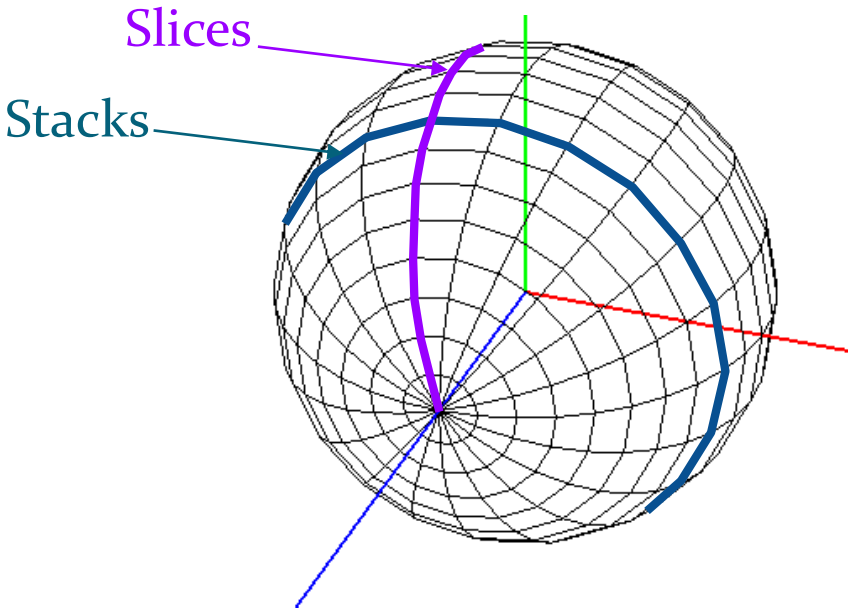


Sphere

Generates a sphere with the specified radius at the origin. The polar axis of the sphere is along the z-axis.

```
glutSolidSphere(radius, slices, stacks);
```

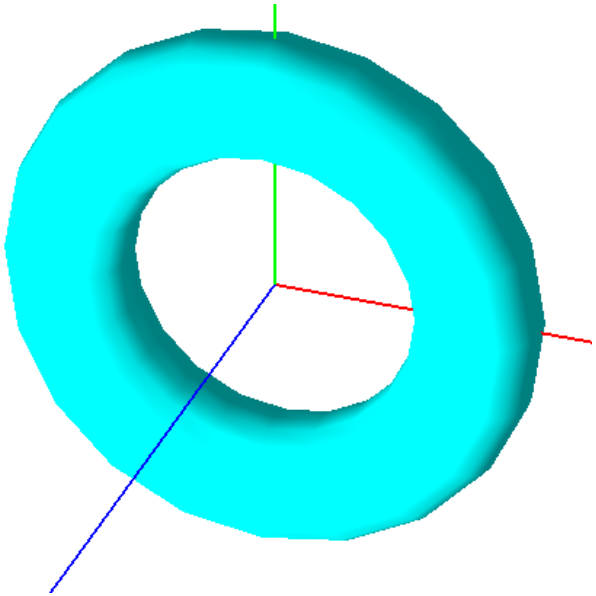


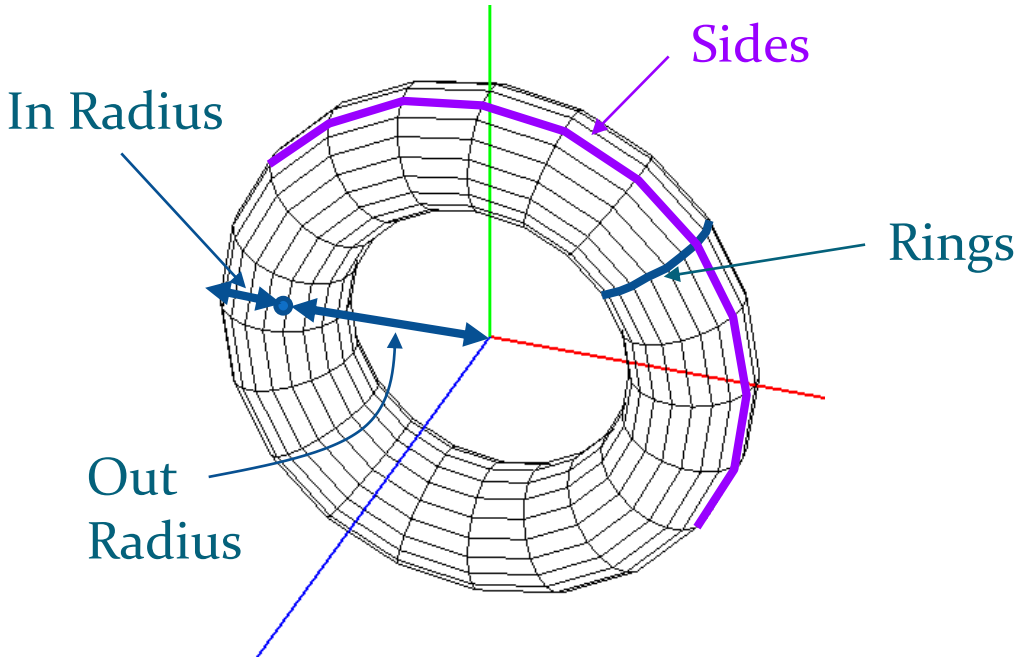


Torus

Generates a torus centered at the origin with axis along the z-axis.

```
glutSolidTorus(inRadius, outRadius,
                sides, rings);
```

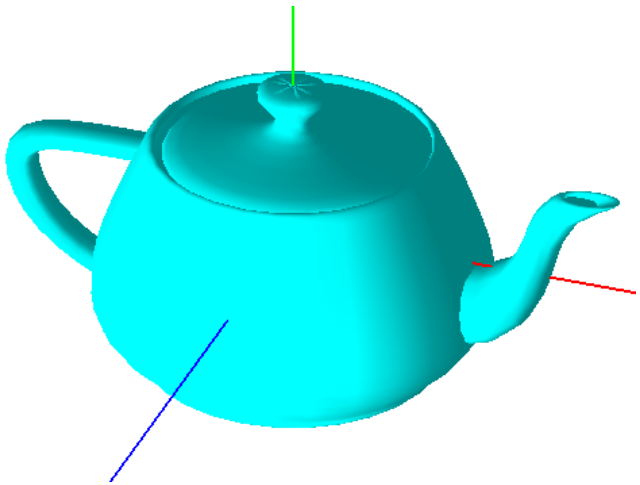


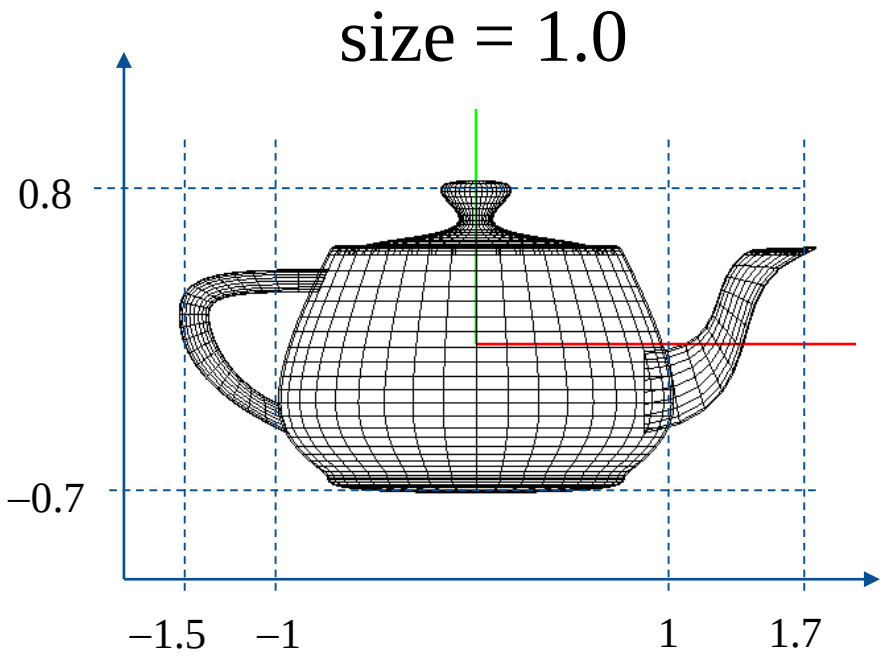


Teapot

Generates a teapot centered at the origin with the spout along the x-axis.

```
glutSolidTeapot(size);
```

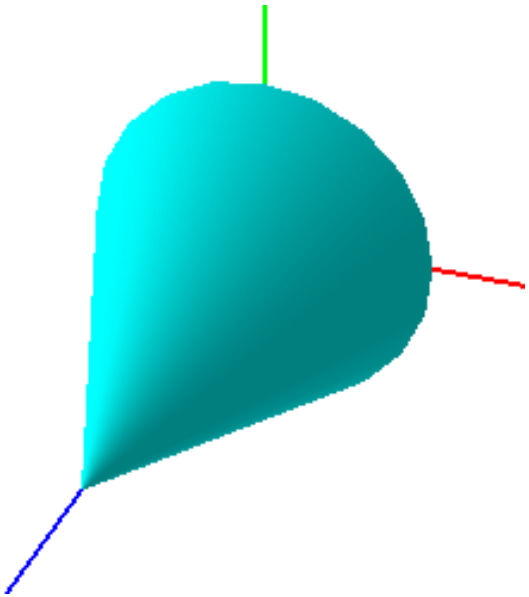


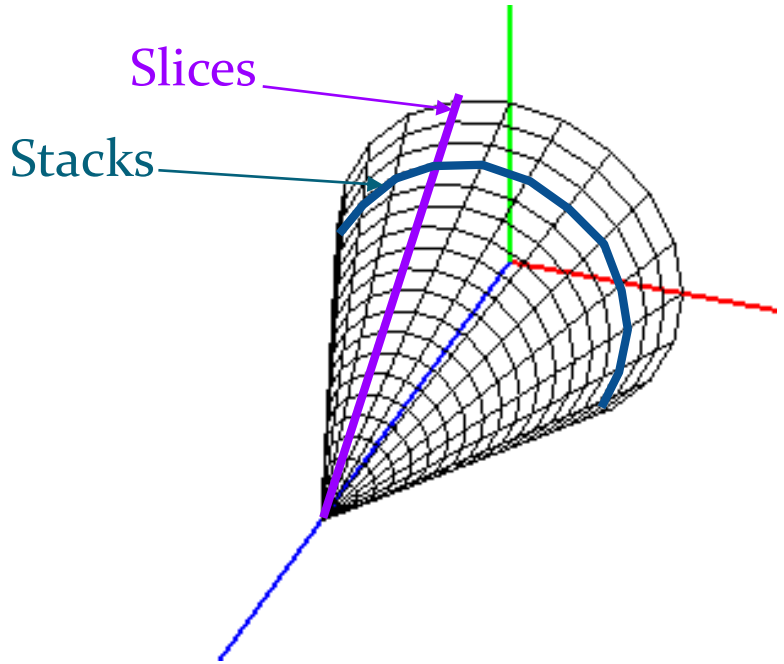


Cone

Generates a cone with the centre of the base at the origin, base on the xy-plane, and axis along the z-axis. The model does not include the base of the cone.

```
glutSolidCone(baseRadius, height, slices,
              stacks);
```

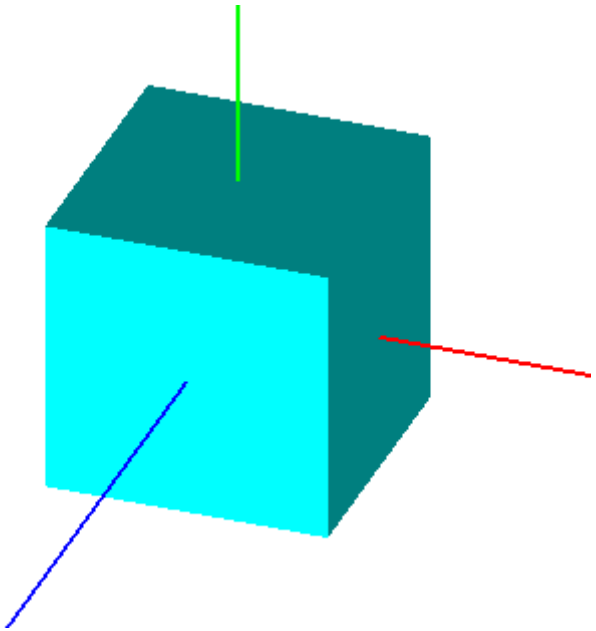


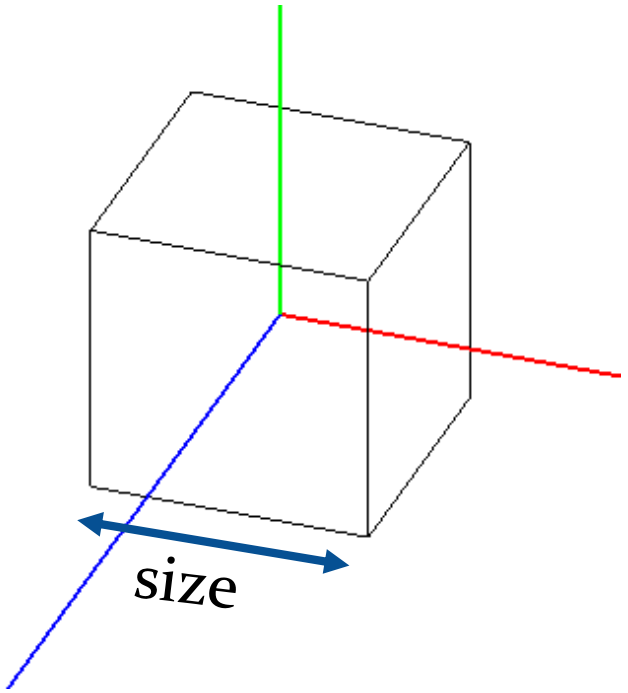


Cube

Generates an axis aligned cube centred at the origin, with the length of each side being defined by the size parameter.

```
glutSolidCube(size);
```

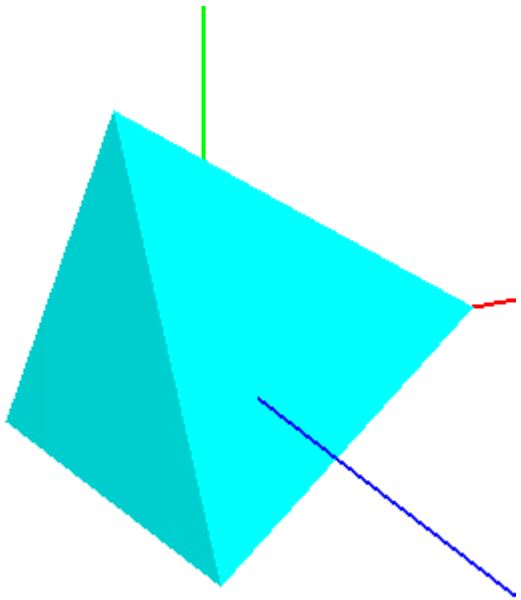


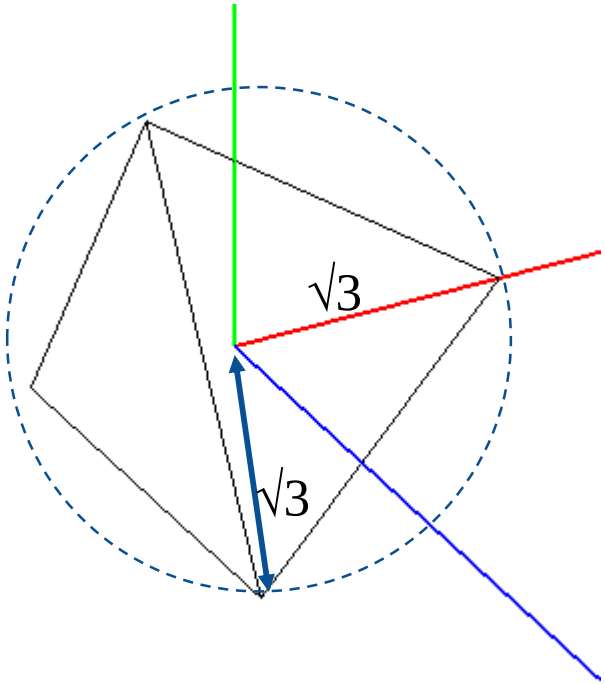


Tetrahedron

Generates a tetrahedron of radius √3 units at the origin. A tetrahedron has 4 vertices and 4 faces (equilateral triangles)

```
glutSolidTetrahedron();
```

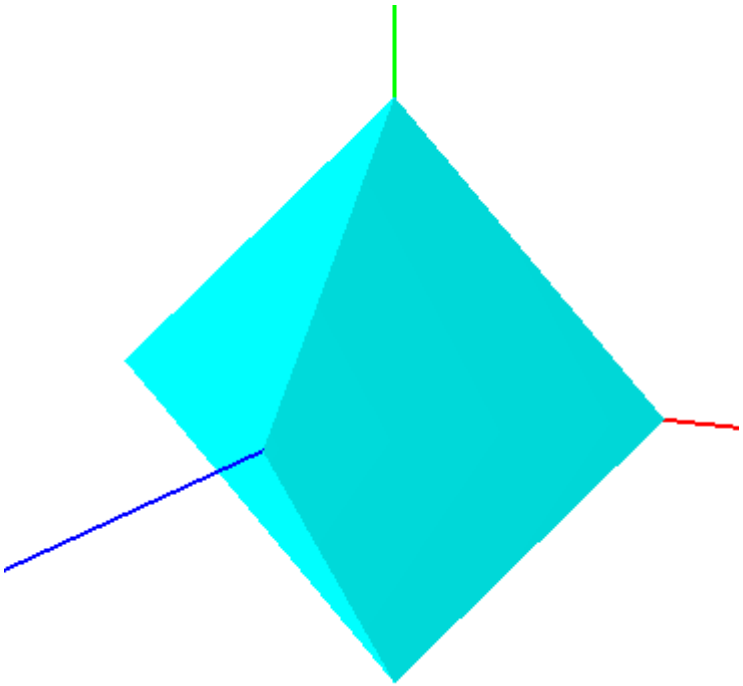


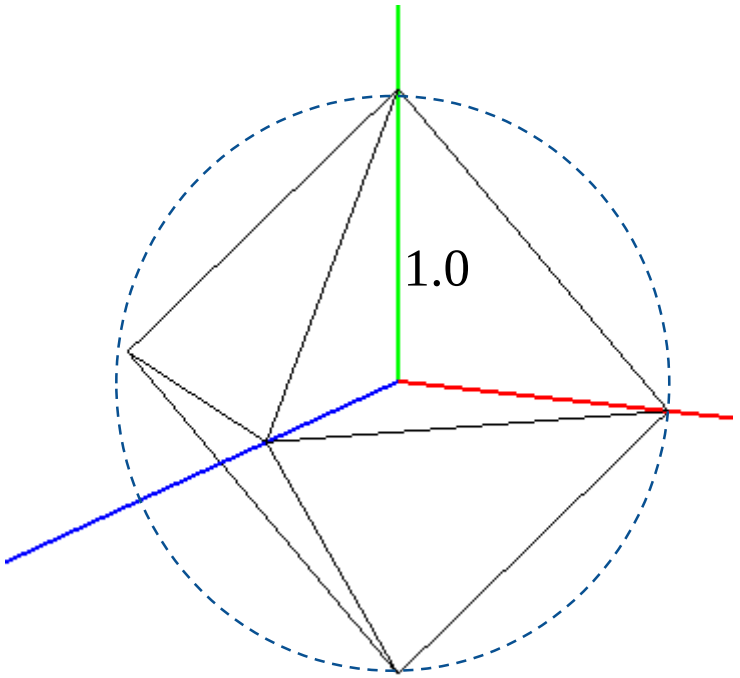


Octahedron

Generates an octahedron of radius 1 unit at the origin. An octahedron has 6 vertices and 8 faces (equilateral triangles)

```
glutSolidOctahedron();
```

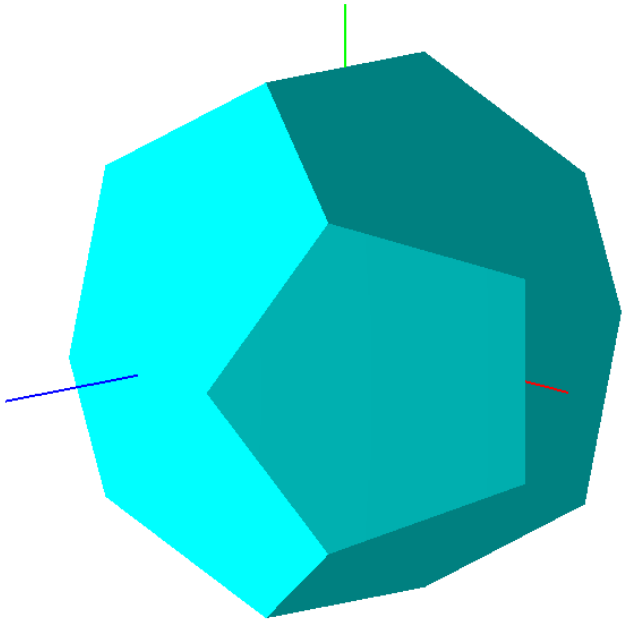


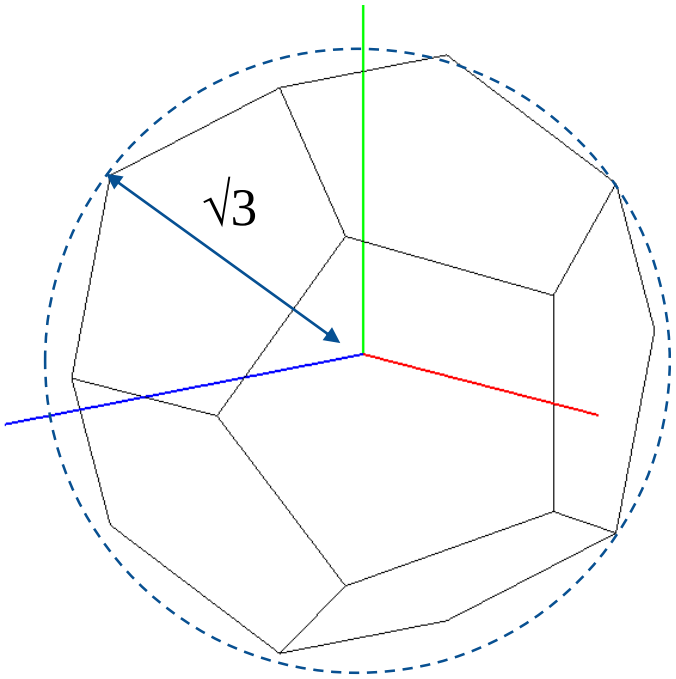


Dodecahedron

Generates a dodecahedron of radius √3 units at the origin. A dodecahedron has 20 vertices and 12 faces (equilateral pentagons)

```
glutSolidDodecahedron();
```

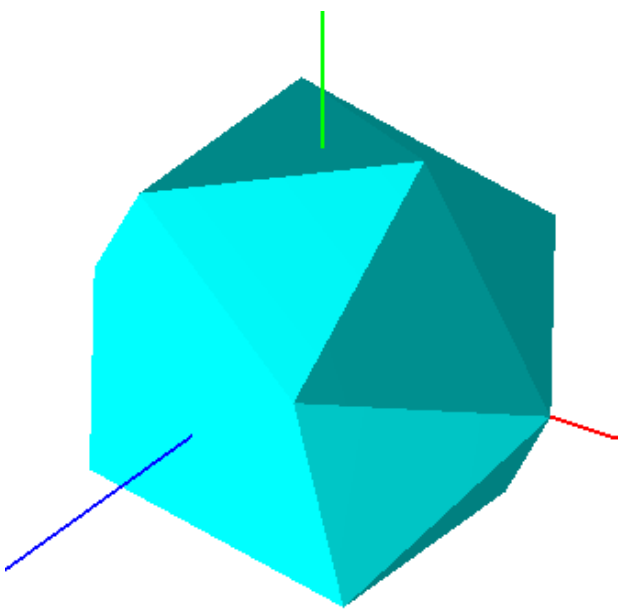


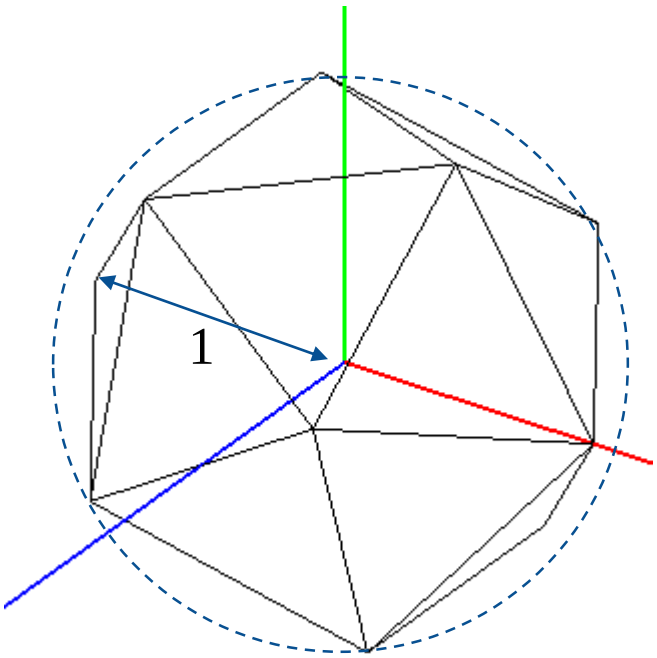


Icosahedron

Generates an icosahedron of radius 1 unit at the origin. An icosahedron has 12 vertices and 20 faces (equilateral triangles)

```
glutSolidIcosahedron();
```

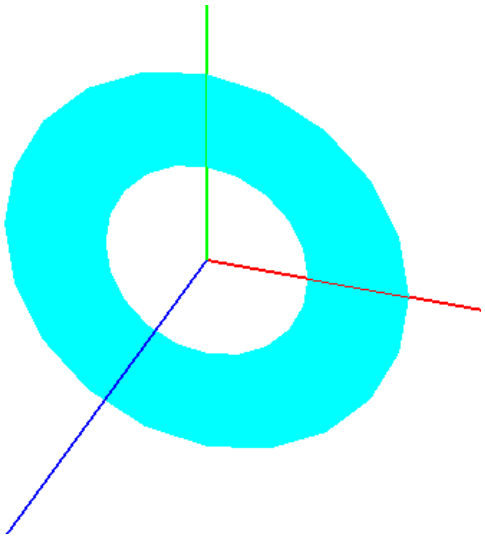


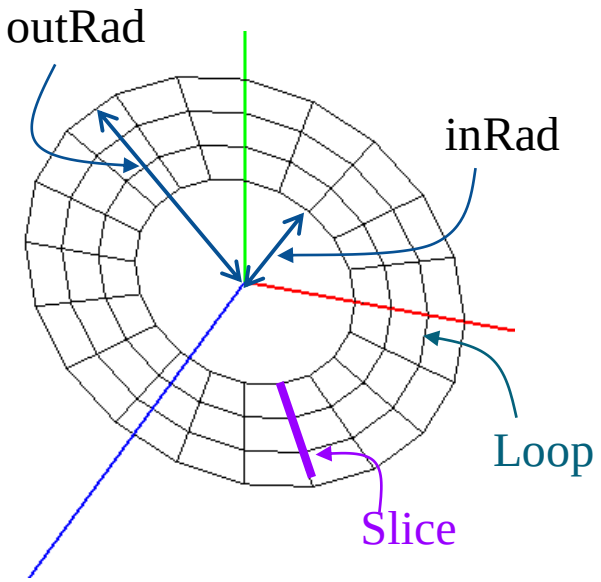


Disk (GLU)

Generates a disc on the xy-plane with centre at the origin.

```
GLUquadric *q;
q  = gluNewQuadric();
gluDisk(q, inRad, outRad, slices, loops);
gluQuadricDrawStyle(q, GLU_FILL);
```

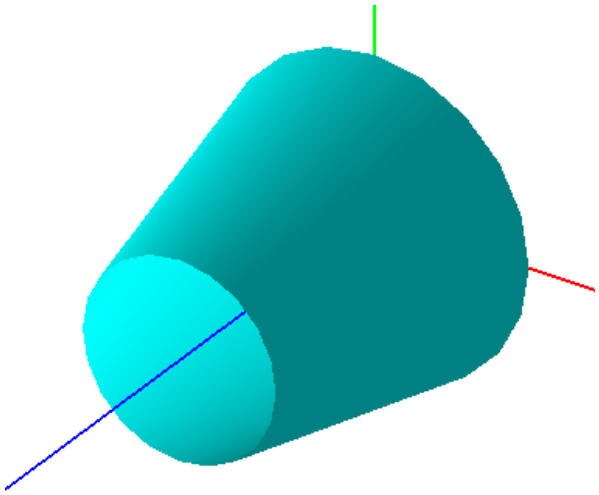


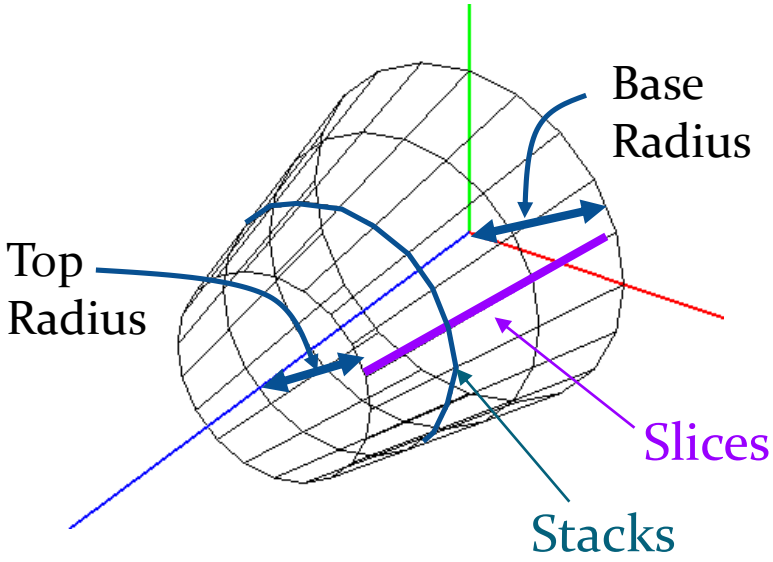


Cylinder (GLU)

Generates a cylinder at the origin with base on the xy-plane, and axis along the z-axis.

```
GLUquadric *q;
q = gluNewQuadric();
gluCylinder(q, baseRadius, topRadius, height, slices,
            stacks);
gluQuadricDrawStyle(q, GLU_FILL);
```

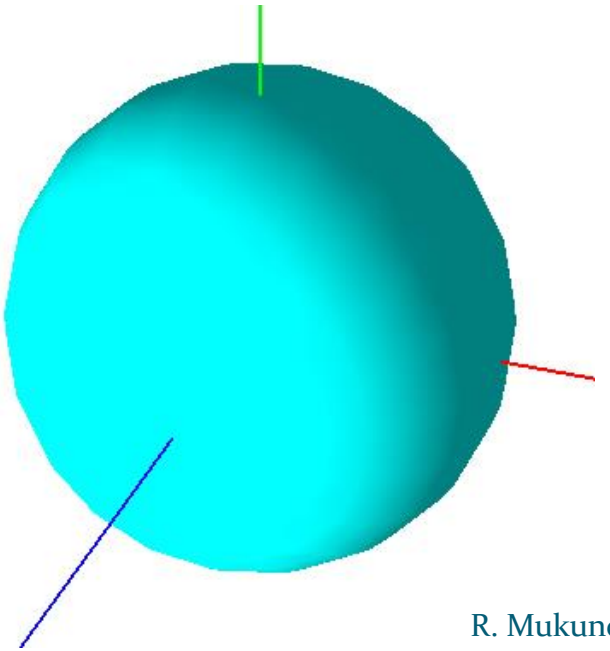


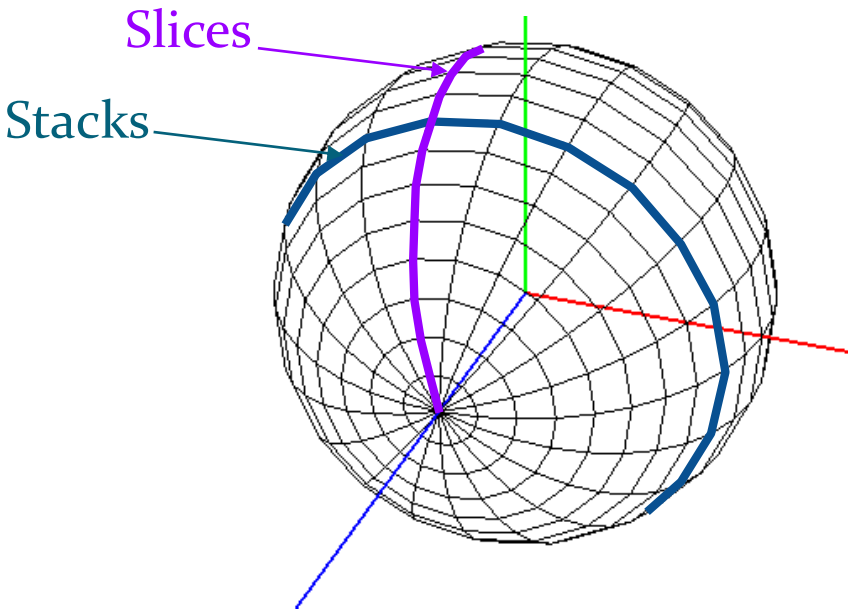


Sphere (GLU)

Generates a sphere at the origin. Same as glutSolidSphere(). See next slide.

```
GLUquadric *q;
q = gluNewQuadric();
gluSphere(q, radius, slices, stacks);
gluQuadricDrawStyle(q, GLU_FILL);
```





Texturing Quadric Objects

Quadric objects have a parametric representation that allows automatic generation of texture coordinates. So, if you need to texture a sphere, use gluSphere() function instead of glutSolidSphere().

```
GLUquadric *q;
q = gluNewQuadric();
gluQuadricTexture(q, GL_TRUE);
```