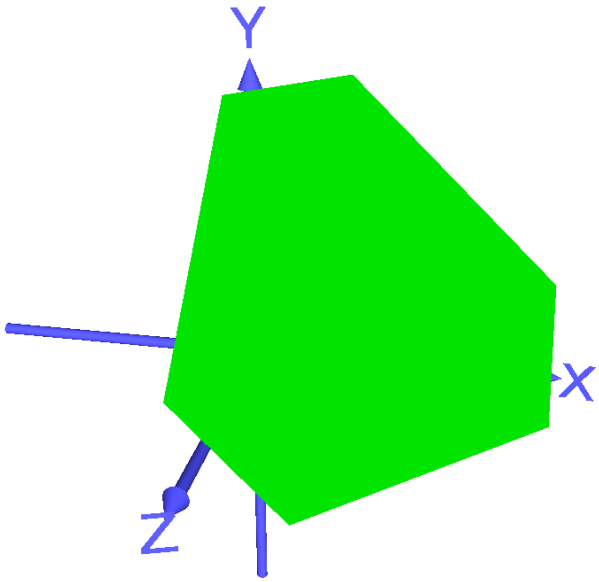
CZ2003: Lab 4

Name:	**Last two digits of the matric card:**

Q1

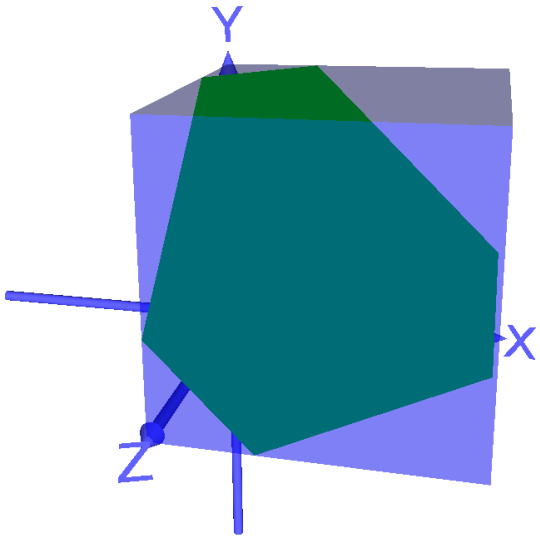
Plane 1



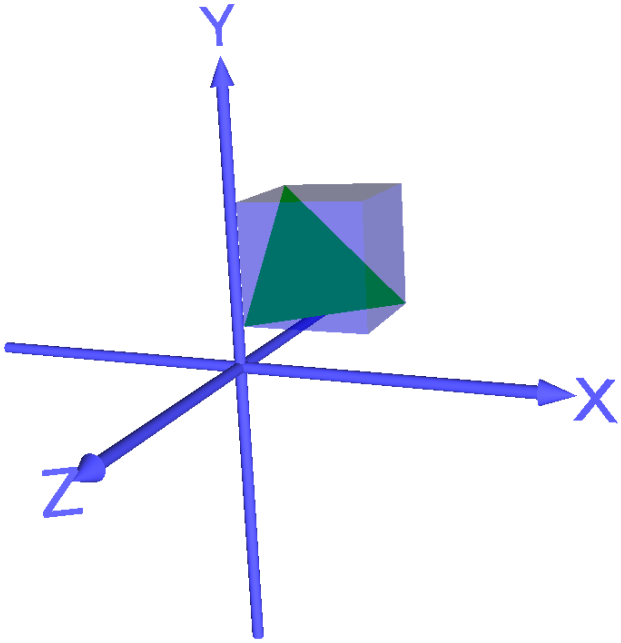
Sampling resolution [2 2 2]
bboxCenter 3 3 3
bboxSize 6 6 6

Name of the file: Q1a.wrl

Plane 1 with bounding box



Plane 2



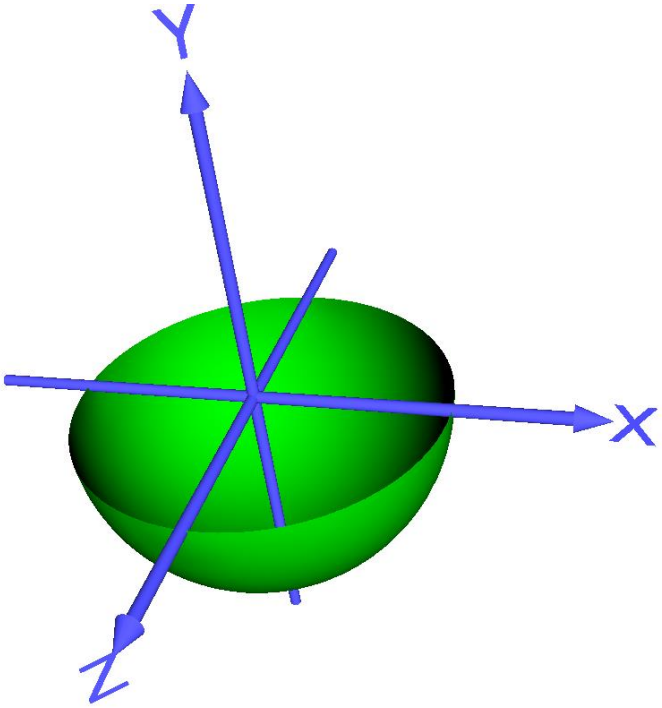
Sampling resolution [2 2 2]
bboxCenter 3 3 3
bboxSize 2 2 2

Note

In Plane 2, when the bounding box size is reduced to (2 2 2), the shape of the plane can form into a small triangle.
To show that the plane pass through the 3 coordinates, the bounding box center is set to (3 3 3) and the bounding box size is set to (6 6 6).
When reducing the sampling resolution to [1 1 1], the plane will not appear. Since it is a plane, increasing the sampling resolution will not affect the plane.

In conclusion, the minimum sampling resolution for the plane is [2 2 2], bounding box center is (3 3 3) and the bounding box size is (6 6 6).

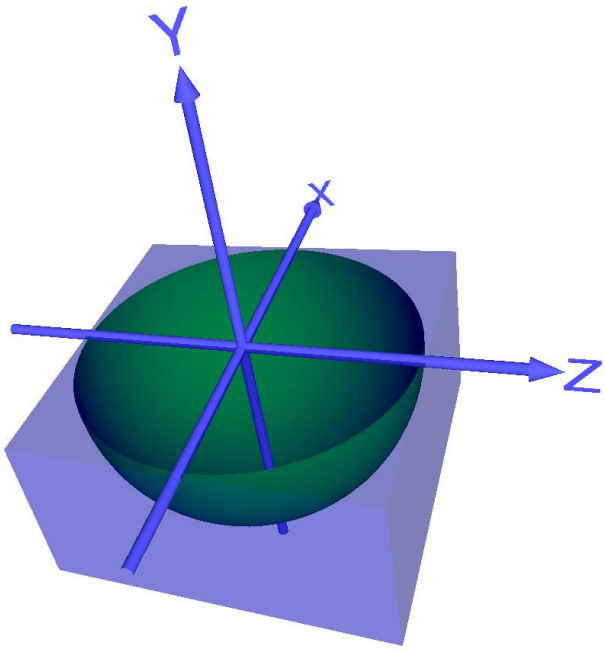
1b	Lower half of the surface of sphere 1



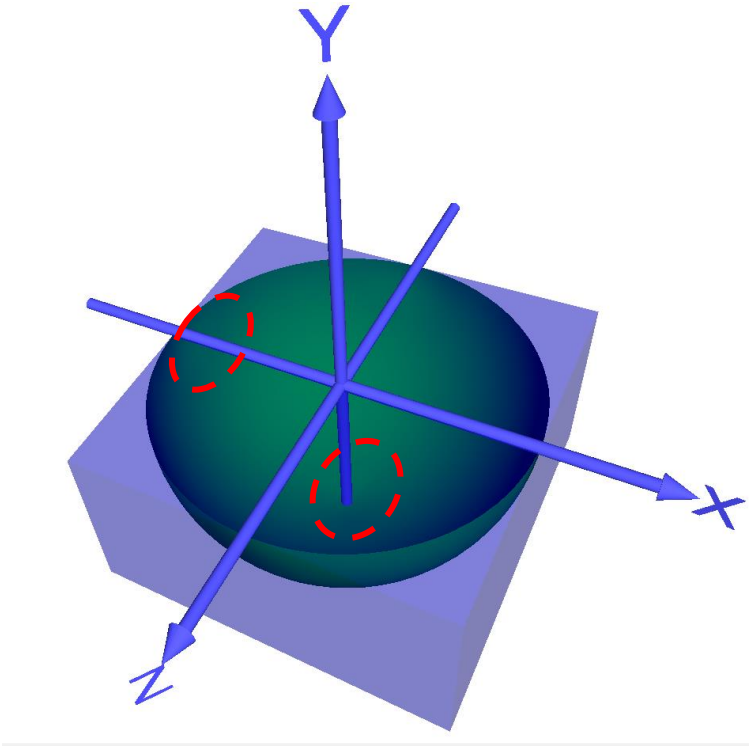
Sampling resolution [30 30 30]
bboxCenter 0 -1 0
bboxSize 4.1 2.05 4.1

Name of the file: Q1b.wrl

Lower half of the surface of sphere 1 with bounding box

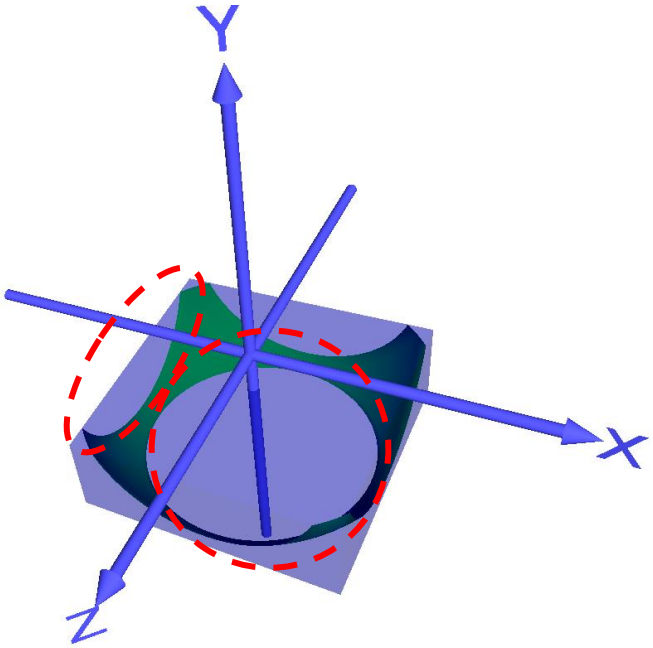


Lower half of the surface of sphere 2

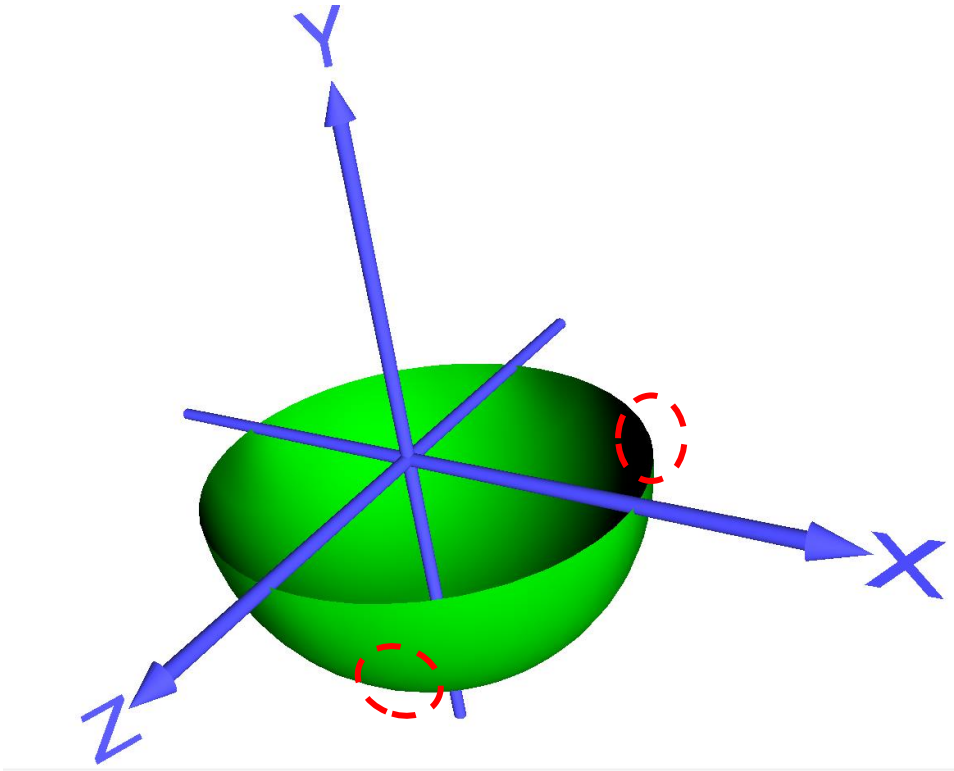


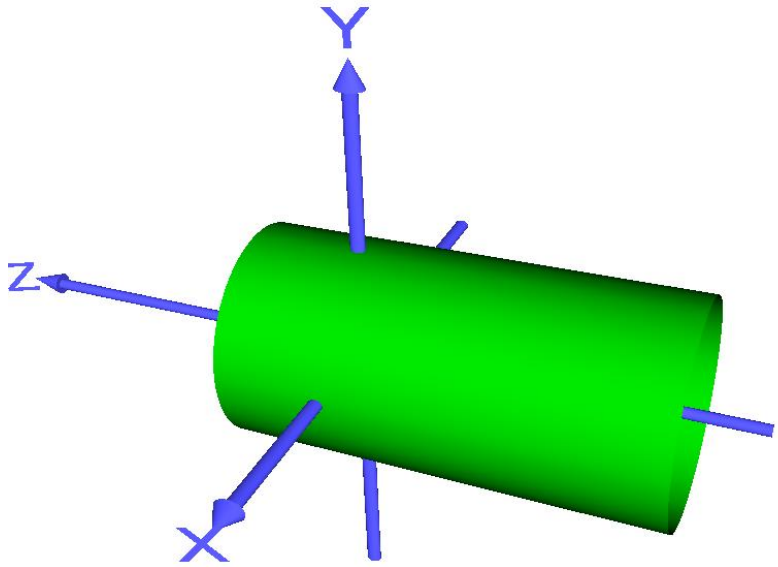
Sampling resolution [30 30 30]
bboxCenter 0 -1 0
bboxSize 4 2 4

Lower half of the surface of sphere 3



Sampling resolution [30 30 30]
bboxCenter 0 -1 0
bboxSize 3 1.05 3

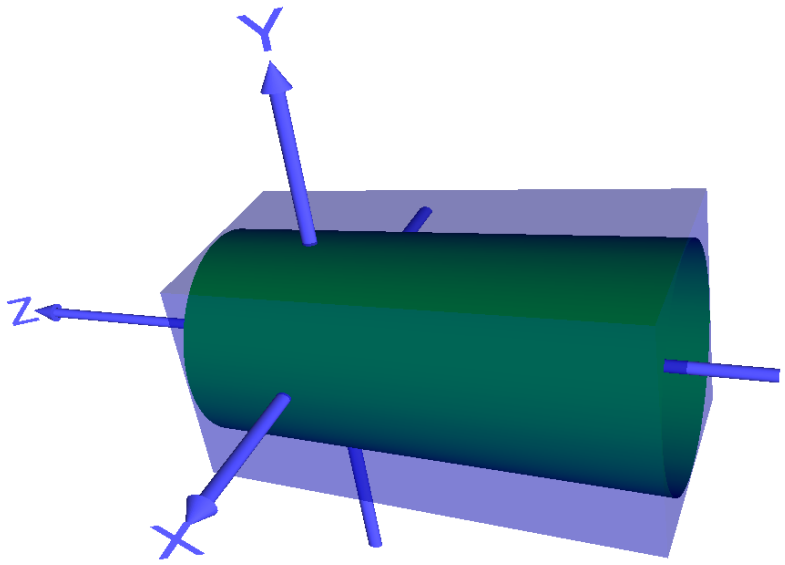
	Lower half of the surface of sphere 4
	
	Sampling resolution [20 20 20] bboxCenter 0 -1 0 bboxSize 4.1 2.05 4.1
	Note
	In lower half of the surface of sphere 2, when the bounding box touches the surface of the sphere, flat surface is form. In lower half of the surface of sphere 3, when the bounding box is further reduced the shape change, as the sphere is being sliced by the bounding box. In lower half of the surface of sphere 4, when the sampling resolution is reduced to [20 20 20], notice the line are form on the curve surface of the sphere. In conclusion, the minimum sampling resolution of the lower half of the surface of sphere is [30 30 30], bounding box center is (0 -1 0) and the bounding box size is (4.1 2.05 4.1).
1c	Cylindrical Surface 1



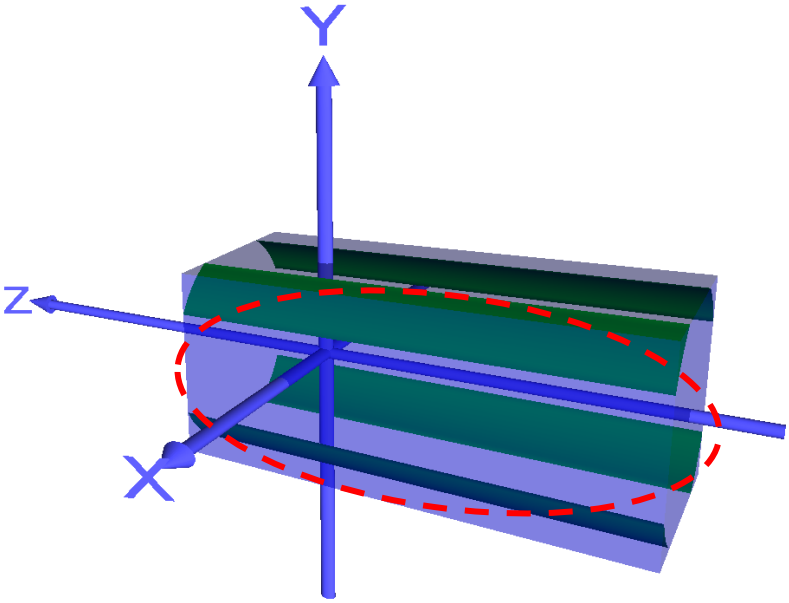
Sampling resolution [55 55 2]
bboxCenter 0 0 -2
bboxSize 4.1 4.1 8

Name of the file: Q1c.wrl

Cylindrical Surface 1 with bounding box

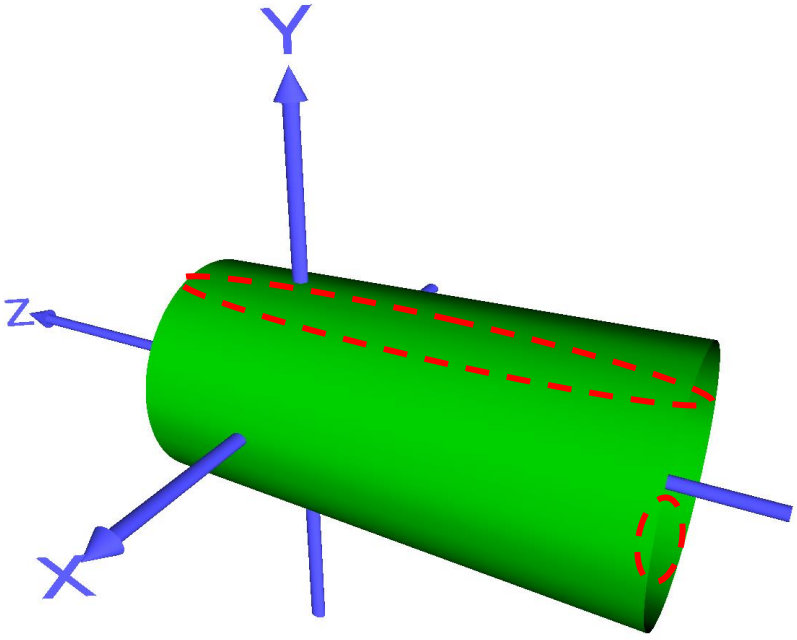


Cylindrical Surface 2



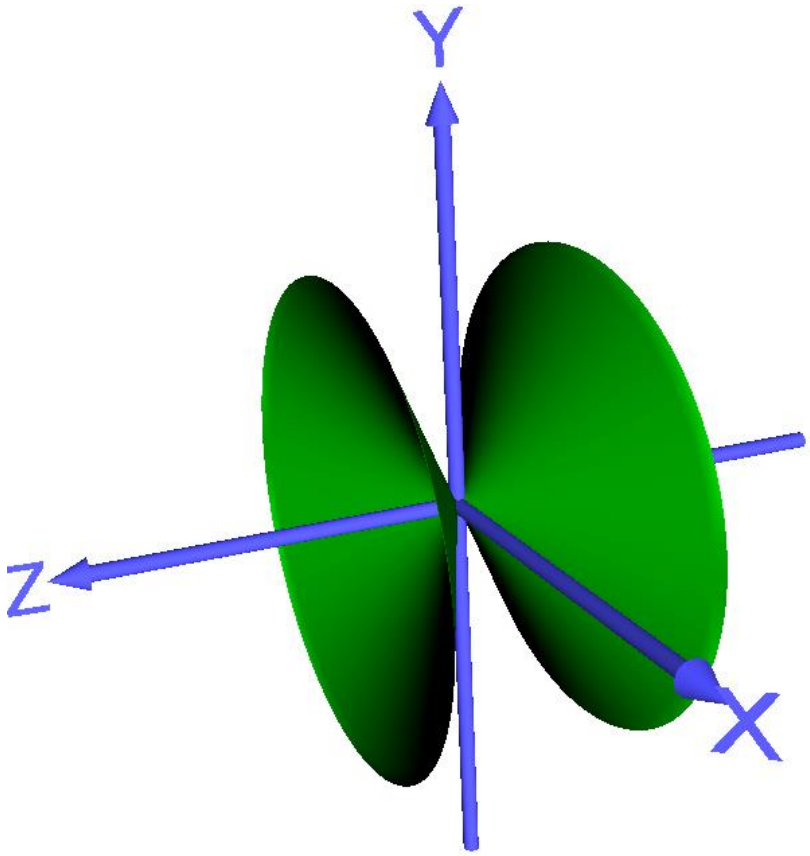
Sampling resolution [55 55 2]
bboxCenter 0 0 -2
bboxSize 3.5 3.5 8

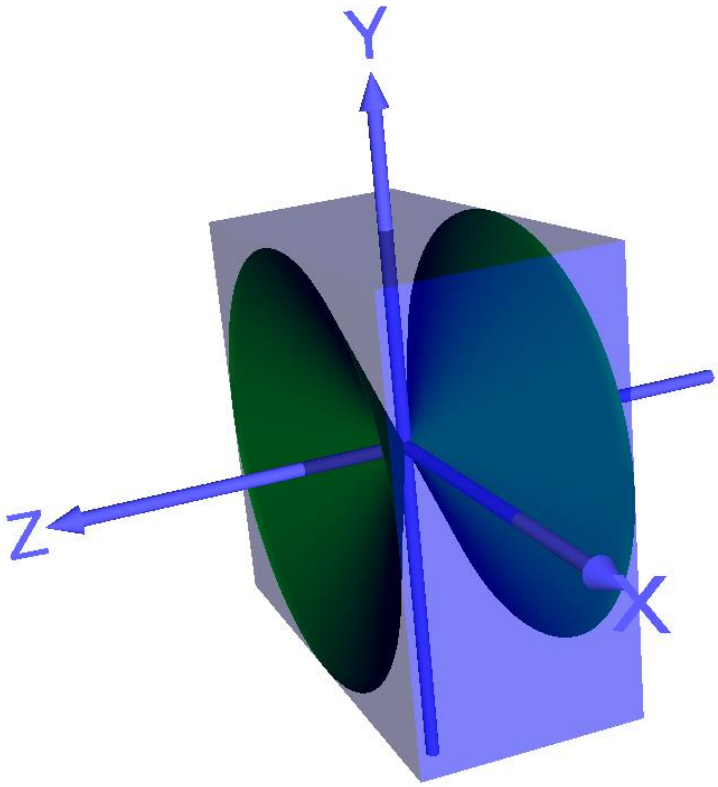
Cylindrical Surface 3



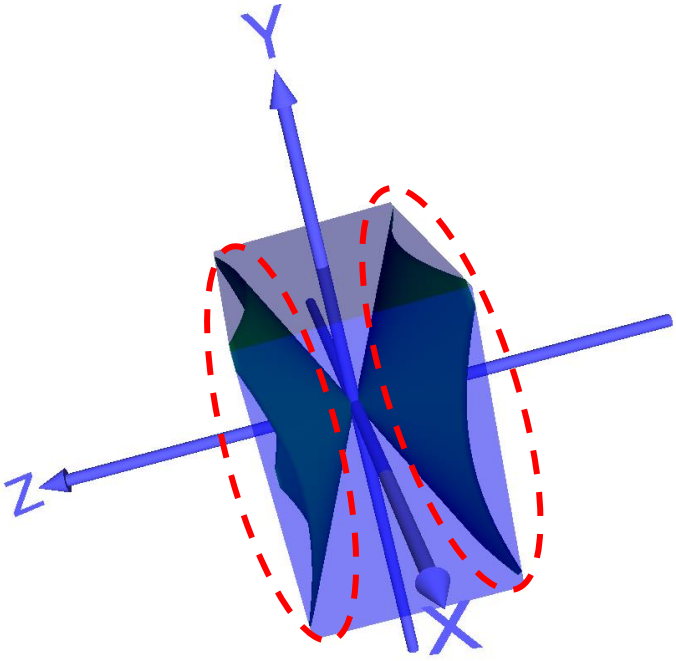
Sampling resolution [35 35 2]
bboxCenter 0 0 -2
bboxSize 4.1 4.1 8

Note

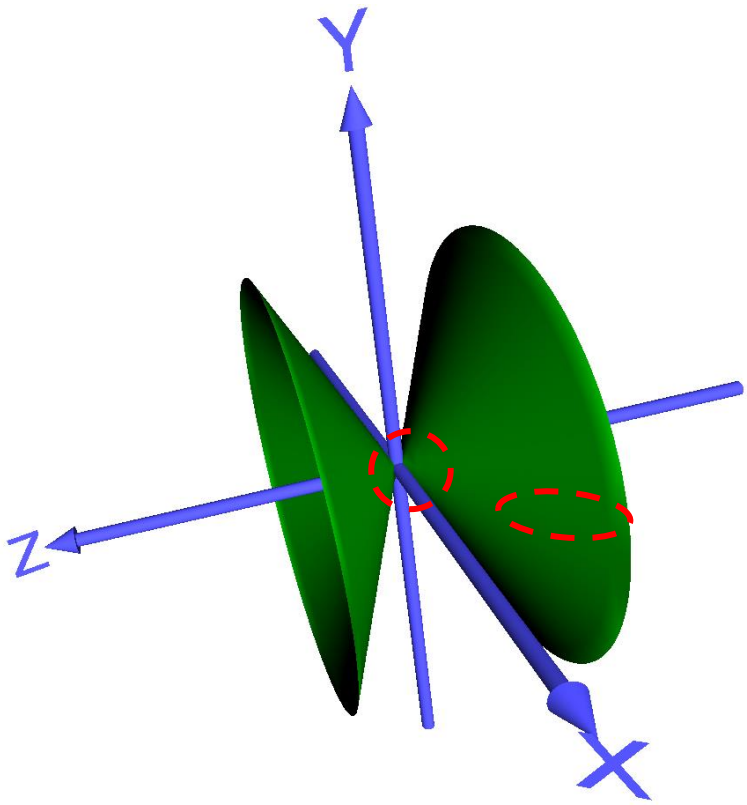
	In Cylindrical Surface 2, when the bounding box size of x and y is reduced to 3.5. The cylindrical surface is being sliced by the bounding box causing other form off surface being display. To produce the spans from -6 to 2 aligned with axis z, the bounding box center must shift by -2 along the axis z and the bounding box size of axis z must be set to 8. In Cylindrical Surface 3, when the sampling resolution is reduced to [35 35 2]. Lines are form on the cylindrical surface. In conclusion, the minimum sampling resolution of cylindrical surface is [55 55 2], bounding box center is (0 0 -2) and the bounding box size is (4.1 4.1 8).
Q1d	Two-side Conical Surface 1
	
	Sampling resolution [40 40 40] bboxCenter 0 0 0 bboxSize 4 4 2
	Name of the file: Q1d.wrl
	Two-side Conical Surface 1 with bounding box

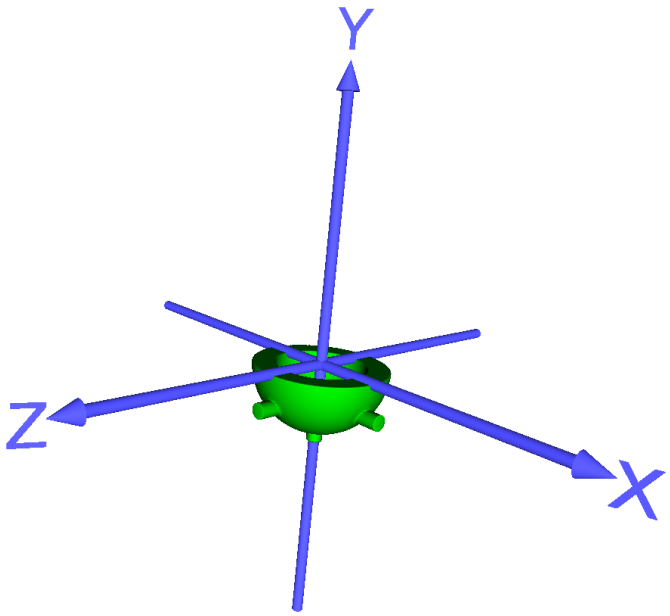


Two-side Conical Surface 2



Sampling resolution [40 40 40]
bboxCenter 0 0 0
bboxSize 3 3 2

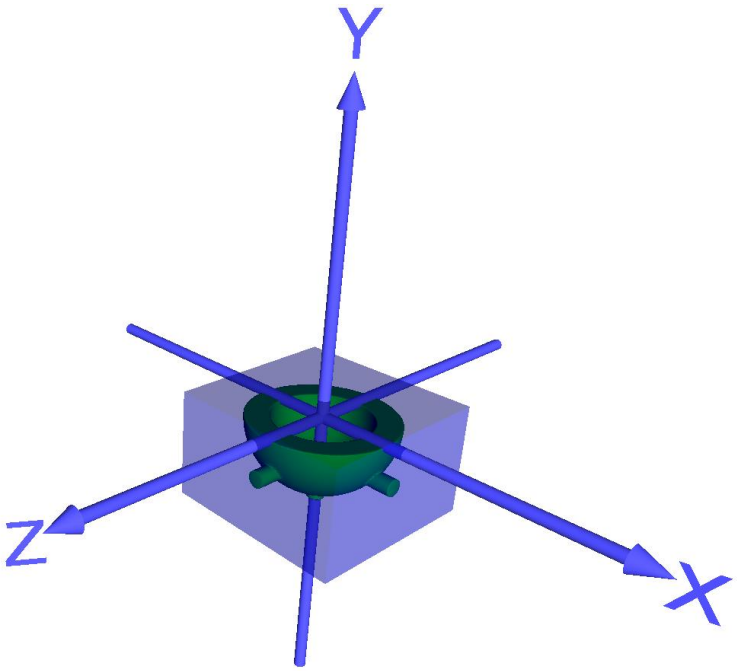
	Two-side Conical Surface 3
	
	Sampling resolution [30 30 30] bboxCenter 0 0 0 bboxSize 4 4 2
	Note
	In Two-side Conical Surface 2, when the bounding box of axis x and y is reduced to 3, the shape of the two-side conical surface is being slice by the bounding box. Thus, displaying a different form of surface. Having the bounding box size of axis x and y to be 4 is to fit the radius value 2 and the axis z to be 2 is to fit the spans value from -1 to 1. In Two-side Conical Surface 3, when the sampling resolution is reduced to [30 30 30], notice the apex of the cone started to open and lines are form on the surface of the two-side conical. In conclusion, the minimum sampling resolution of the two-side conical surface is [40 40 40], bounding box size is (4 4 2) and the bounding box center is (0 0 0).
Q2	Complex Shape 1



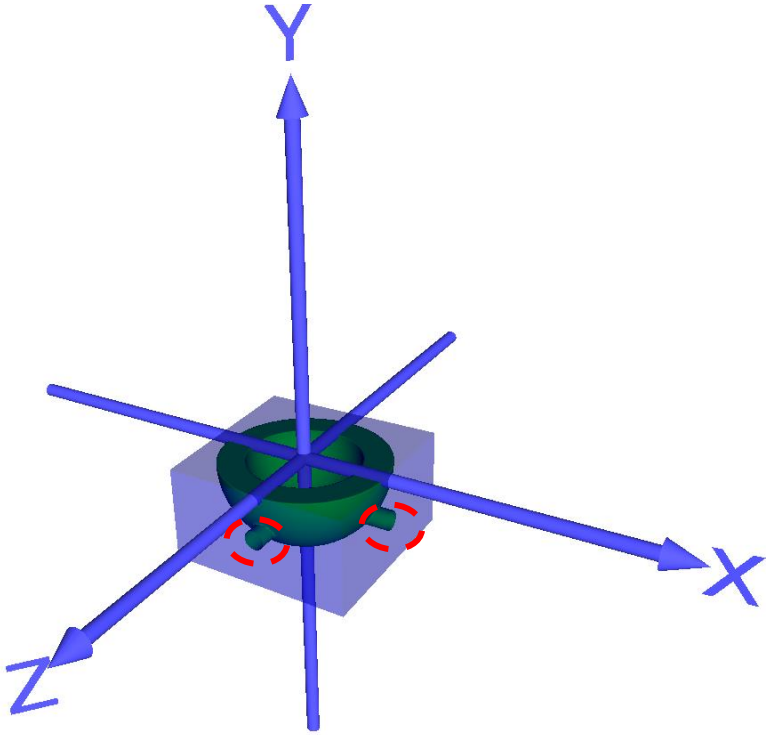
Sampling resolution [135 135 135]
bboxCenter 0 -0.15 0
bboxSize 0.75 0.45 0.75

Name of the file: Q2.wrl

Complex Shape 1 with bounding box

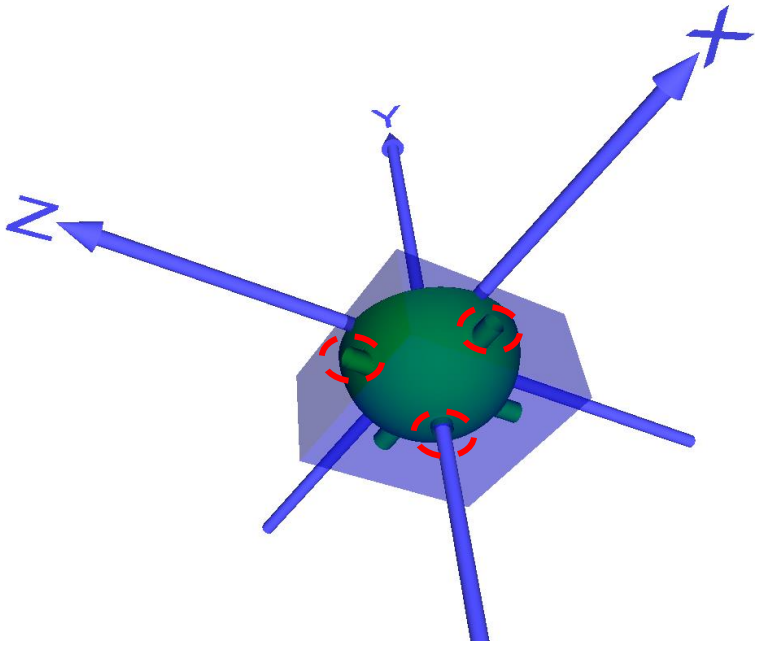


Complex Shape 2

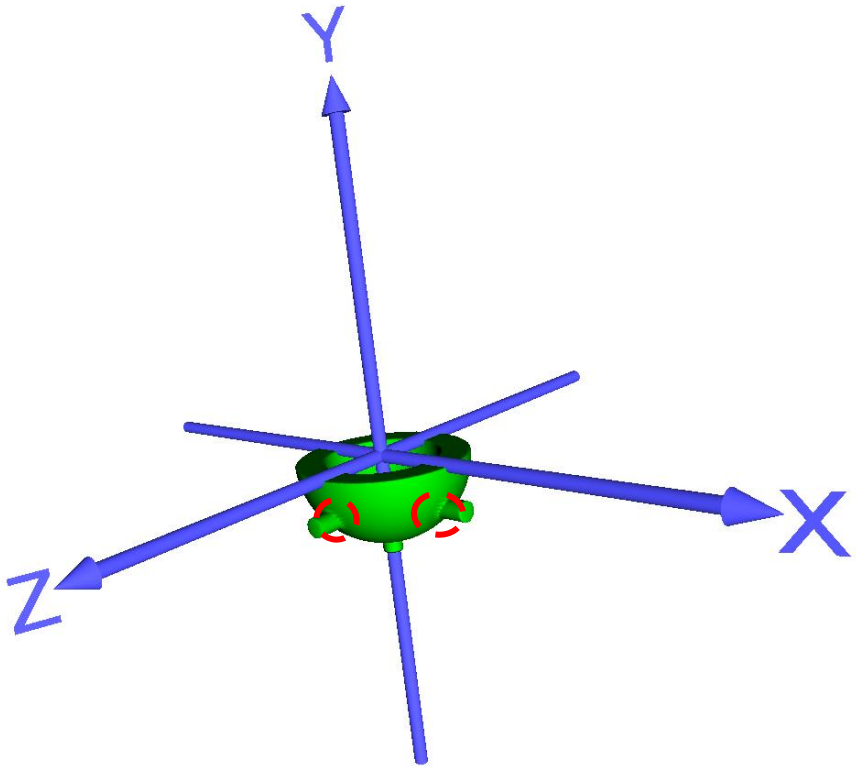


Sampling resolution [135 135 135]
bboxCenter 0 -0.15 0
bboxSize 0.65 0.35 0.65

Complex Shape 2 bottom view



Complex Shape 3



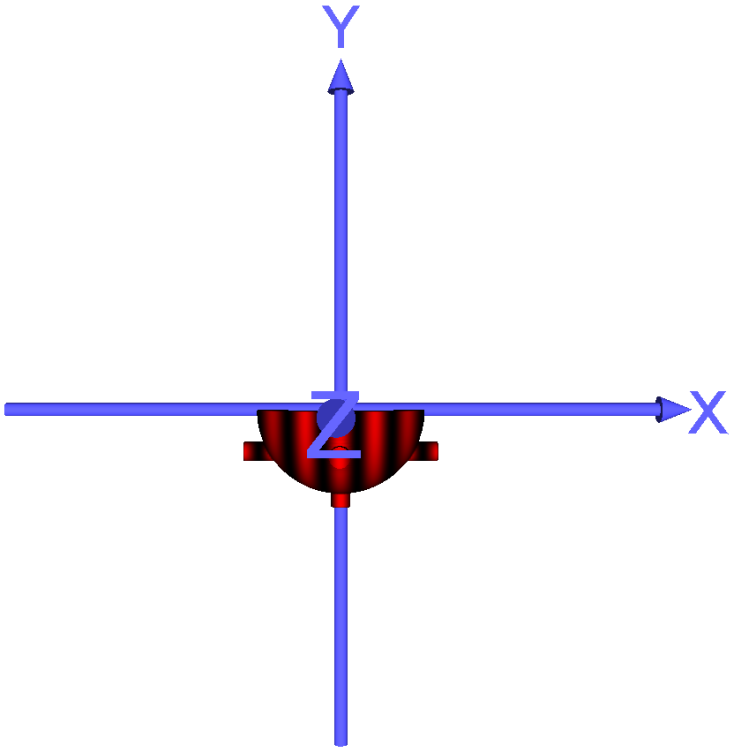
Sampling resolution [100 100 100]
bboxCenter 0 -0.15 0
bboxSize 0.75 0.45 0.75

Note

In Complex Shape 2, when the bounding box size is reduced to (0.65 0.35 0.65), notice the small cylinder at the side of the complex shape being slice off by the bounding box.
In Complex Shape 3, when the sampling resolution is reduced to [100 100 100], notice the smooth surface start to disappear at the connection between the small cylinder and the half spear.

In conclusion, the minimum sampling resolution of the complex shape is [135 135 135], bounding box size is (0.75 0.45 0.75) and the bounding box center is (0 -0.15 0).

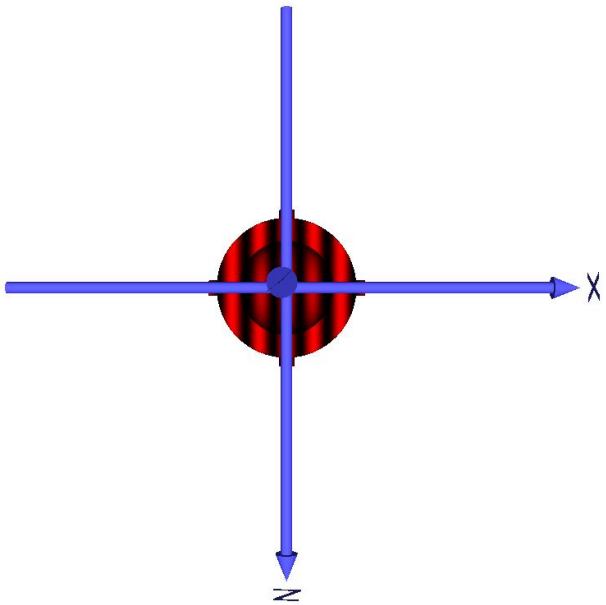
Q3 Color Shape 1



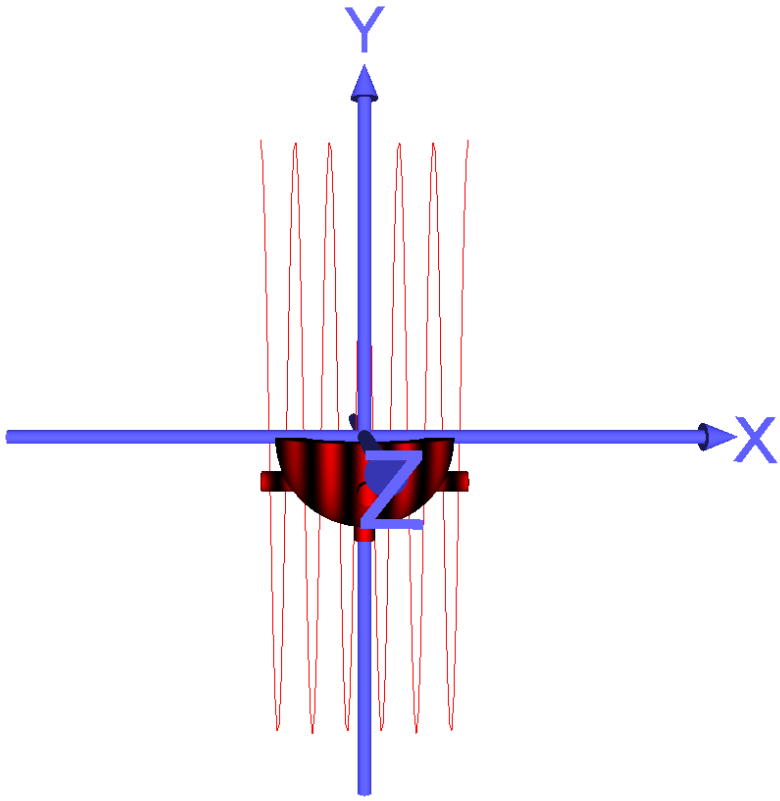
Sampling resolution [135 135 135]
bboxCenter 0 -0.15 0
bboxSize 0.75 0.45 0.75
Diffuse Color r=((cos(u*17.15*pi))/2)+0.5, g=0, b=0

Name of the file: Q3.wrl

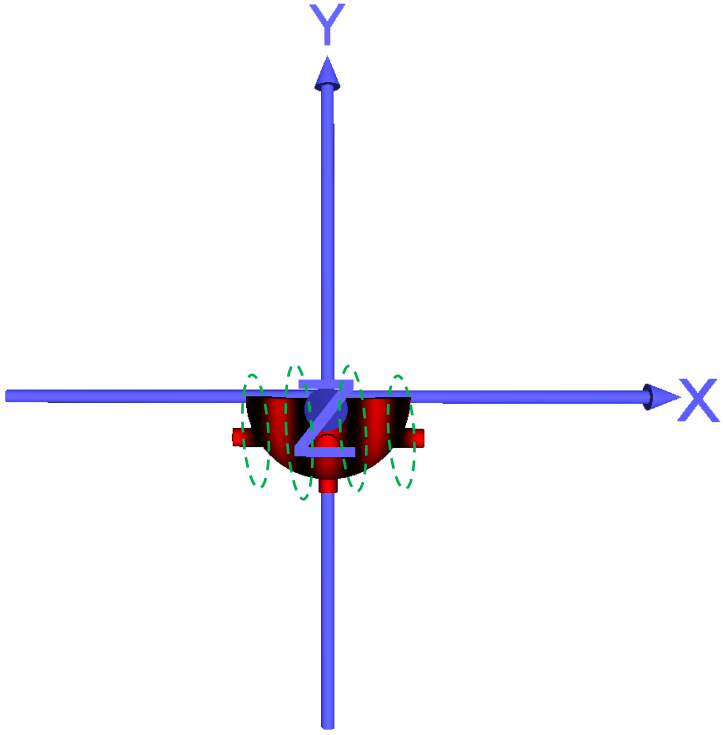
Color Shape 1 top view



Color Shape 1 with Cosine Curve



Color Shape 2



Sampling resolution [135 135 135]
bboxCenter 0 -0.15 0
bboxSize 0.75 0.45 0.75
Diffuse Color r=((cos(u*12*pi))/2)+0.5, g=0, b=0

	Note
	In Color Shape 2, if the diffuse color r equation is ((cos(u*12*pi))/2)+0.5, notice the color of the shape does not provide total of 6 oscillations. This is because the cosine curve equation (cos(u*12*pi)) does not fall between the range from x1 = -0.35 to x2 = 0.35. In conclusion, the minimum sampling resolution of the color shape is [135 135 135], bounding box size is (0.75 0.45 0.75),the bounding box center is (0 -0.15 0) and the diffuse color r=((cos(u*17.15*pi))/2)+0.5, g=0, b=0.