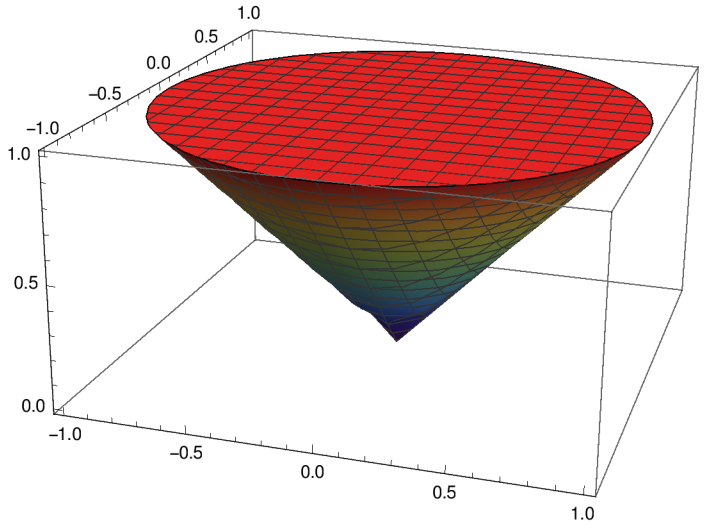
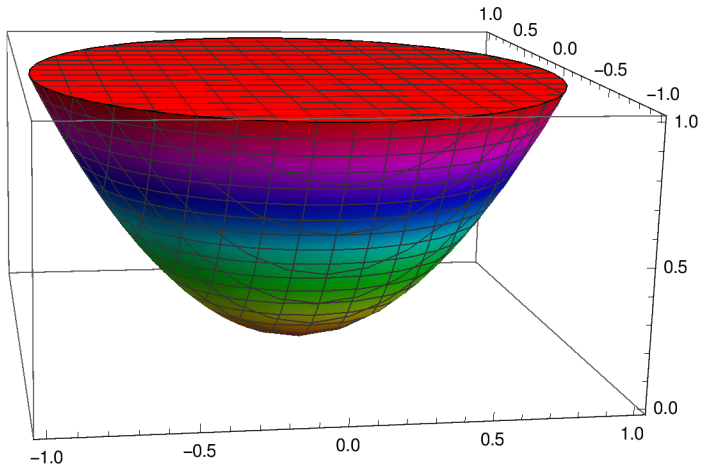
In[2]:=
```
SetOptions[RegionPlot3D(*Or whichever plot you desire*),
  ColorFunction → "Rainbow"(*One of many options*)];
(*SetOptions[RegionPlot3D(*Or whichever plot you desire*),
  ColorFunction→Function[{x,y,z},Hue[z]]];*)
```

```
(*1*)
```

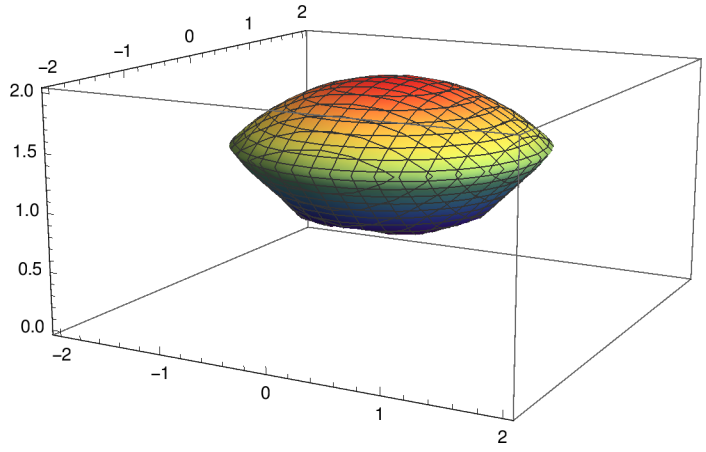
```
RegionPlot3D[z^2 > x^2 + y^2, {x, -1, 1}, {y, -1, 1}, {z, 0, 1}, BoxRatios → Automatic]
```



```
(*2*)
RegionPlot3D[z > x^2 + y^2, {x, -1, 1}, {y, -1, 1}, {z, 0, 1},
 BoxRatios → Automatic, ColorFunction → Function[{x, y, z}, Hue[z]]]
```



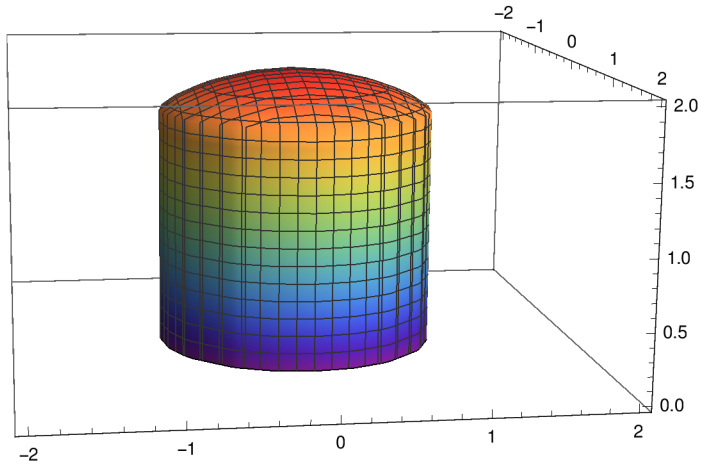

```
(*3*)
RegionPlot3D[4 > z^2 + y^2 + x^2 > 1 && x^2 + y^2 < z^2 ,
 {x, -2, 2}, {y, -2, 2}, {z, 0, 2}, BoxRatios → Automatic]
```



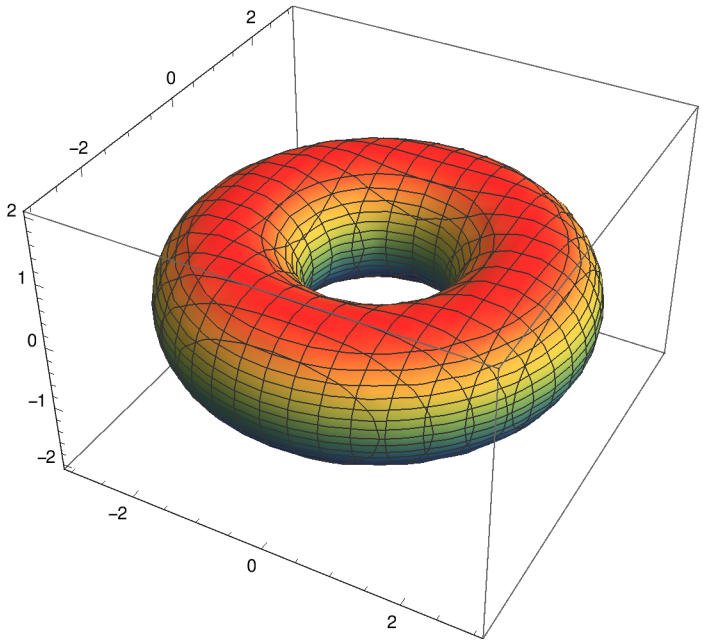

```
(*4*)
```

In[10]:=
```
RegionPlot3D[4 > z^2 + y^2 + x^2 && x^2 + y^2 < 1 ,
 {x, -2, 2}, {y, -2, 2}, {z, 0, 2}, BoxRatios → Automatic]
```

Out[10]=

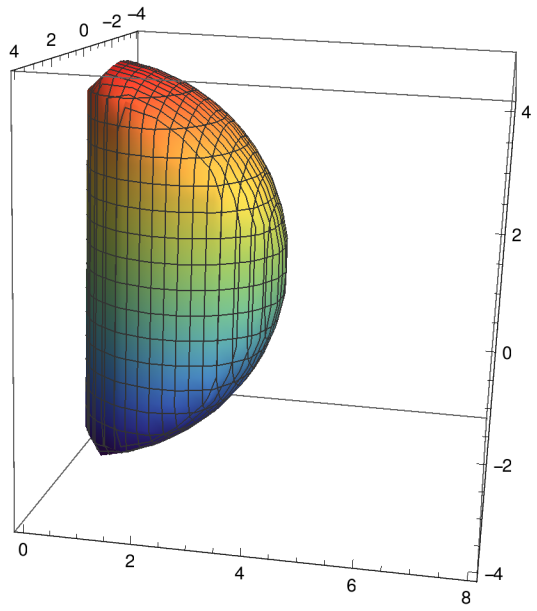



```
(*5*)
RegionPlot3D[(Sqrt[x^2 + y^2] - 2)^2 + z^2 < 1,
 {x, -3, 3}, {y, -3, 3}, {z, -2, 2}, BoxRatios → Automatic]
```



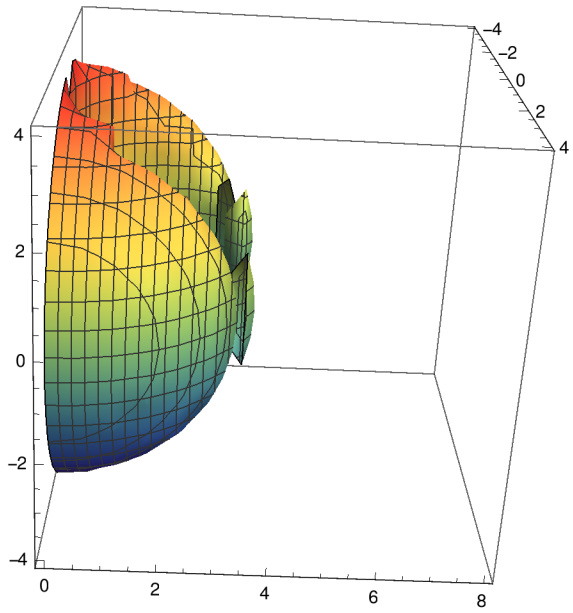

```
(*6 Viviani*)
```

In[5]:=
```
RegionPlot3D[16 > z^2 + y^2 + x^2 && x^2 + y^2 < 4 y,
 {x, -4, 4}, {y, 0, 8}, {z, -4, 4}, BoxRatios → Automatic]
```

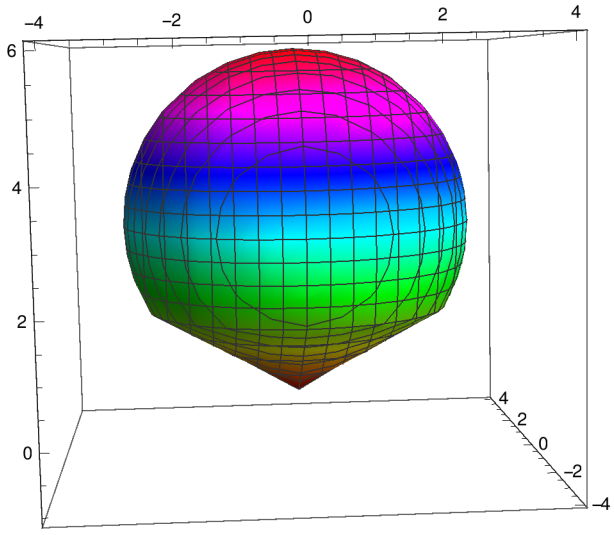


In[6]:=
```
RegionPlot3D[16 > z^2 + y^2 + x^2 && x^2 + y^2 > 4 y,
 {x, -4, 4}, {y, 0, 8}, {z, -4, 4}, BoxRatios → Automatic]
```

Out[6]=

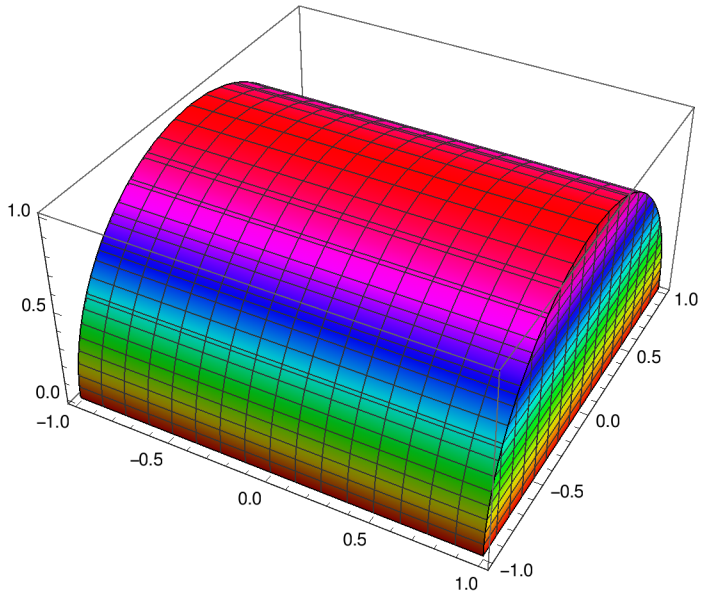


```
(*7*)
RegionPlot3D[6 z > z^2 + x^2 + y^2 && x^2 + y^2 < 3 z^2, {x, -4, 4}, {y, -4, 4},
 {z, -1, 6}, BoxRatios → Automatic, ColorFunction → Function[{x, y, z}, Hue[z]]]
```



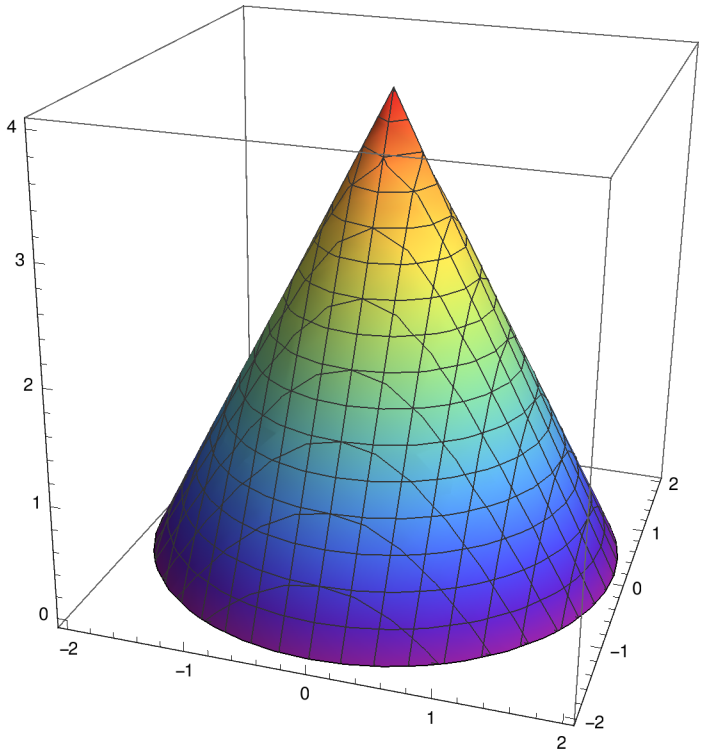

```
(*8*)
```

```
RegionPlot3D[1 > z^2 + y^2, {x, -1, 1}, {y, -1, 1}, {z, 0, 1},
 BoxRatios → Automatic, ColorFunction → Function[{x, y, z}, Hue[z]]]
```

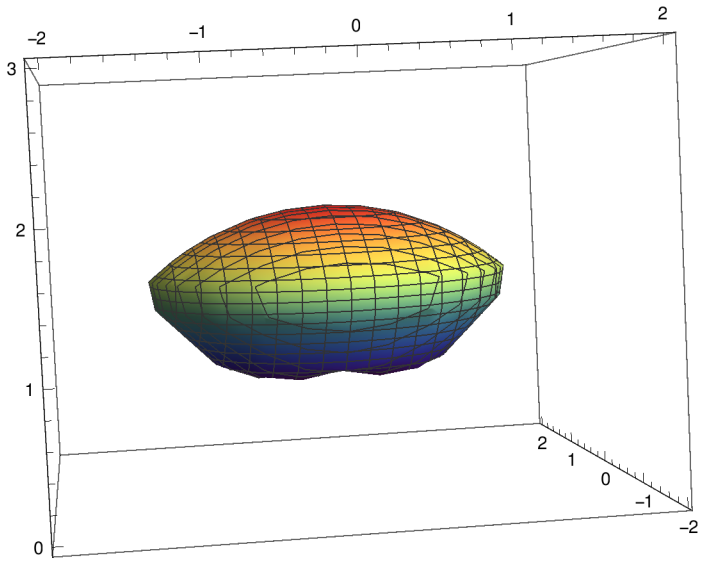



```
(*9*)
```

```
RegionPlot3D[4 - 2 Sqrt[x^2 + y^2] > z,
 {x, -2, 2}, {y, -2, 2}, {z, 0, 4}, BoxRatios → Automatic]
```

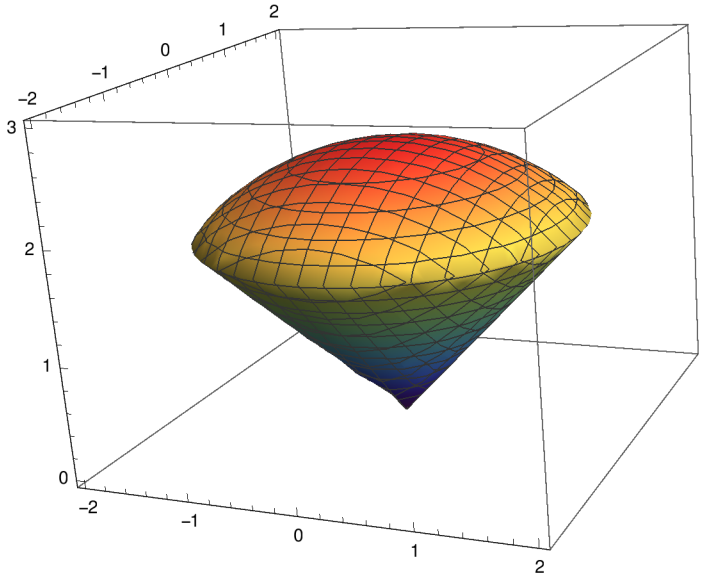


```
(*10*)
RegionPlot3D[z^2 > x^2 + y^2 && 1 < (z^2 + x^2 + y^2) < 4,
 {x, -2, 2}, {y, -2, 2}, {z, 0, 3}, BoxRatios → Automatic]
```



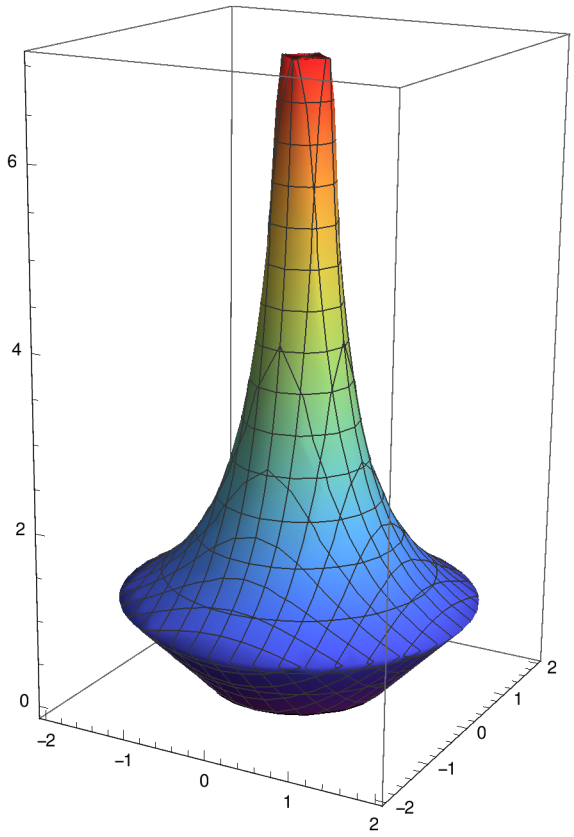

```
(* 11 *)
```

```
RegionPlot3D[z^2 > x^2 + y^2 && z^2 < 6 - (x^2 + y^2),
 {x, -2, 2}, {y, -2, 2}, {z, 0, 3}, BoxRatios → Automatic]
```



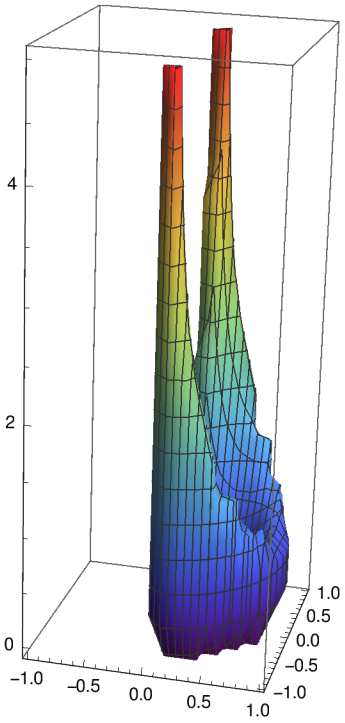
In[21]:=
```
(* 12 *)
RegionPlot3D[z * Sqrt[x^2 + y^2] < 2 && Sqrt[x^2 + y^2] < z + 1,
 {x, -2, 2}, {y, -2, 2}, {z, 0, 7}, BoxRatios → Automatic]
```

Out[21]=



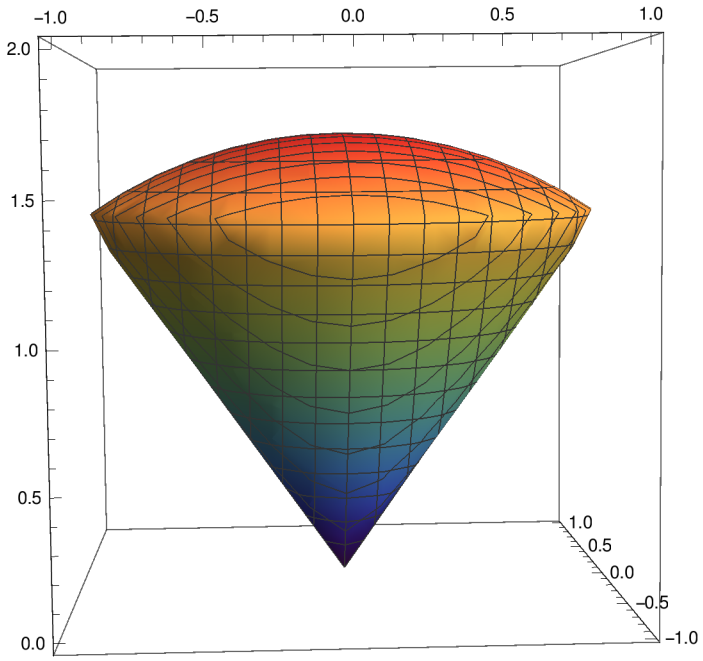
```
(* 13 *)
RegionPlot3D[0 < x * z < x^2 + y^2 < 1,
 {x, -1, 1}, {y, -1, 1}, {z, 0, 5}, BoxRatios → Automatic]
```

Out[18]=



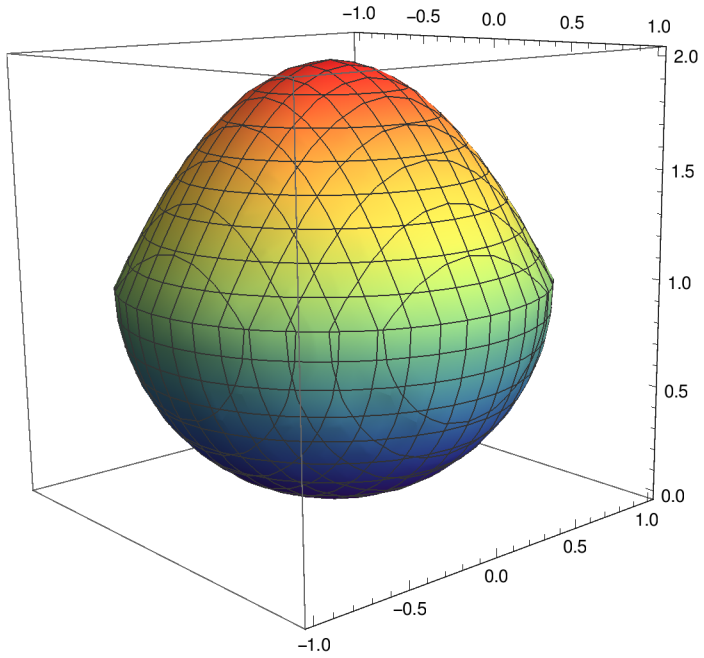
In[25]:=
```
(* 14 *)
RegionPlot3D[(z^2) / 2 > x^2 + y^2 && z < Sqrt[3 - (x^2 + y^2)],
 {x, -1, 1}, {y, -1, 1}, {z, 0, 2}, BoxRatios → Automatic]
```

Out[25]=



In[29]:=
```
(* 15 *)
RegionPlot3D[2 - z > x^2 + y^2 && z^2 + (x^2 + y^2) < 2 z,
 {x, -1, 1}, {y, -1, 1}, {z, 0, 2}, BoxRatios → Automatic]
```

Out[29]=



In[36]:=
```
(* 16 *)
RegionPlot3D[z > 8 x^2 + 2 y^2 && z < 4 - (8 x^2 + 2 y^2),
 {x, -1, 1}, {y, -2, 2}, {z, 0, 4}, BoxRatios → Automatic]
```

Out[36]=