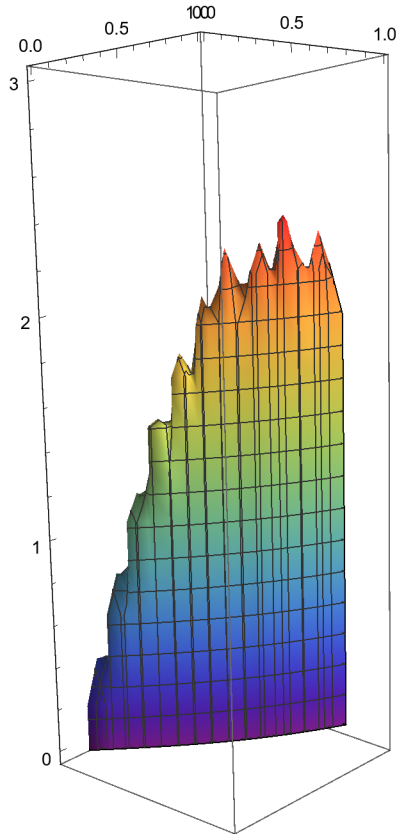
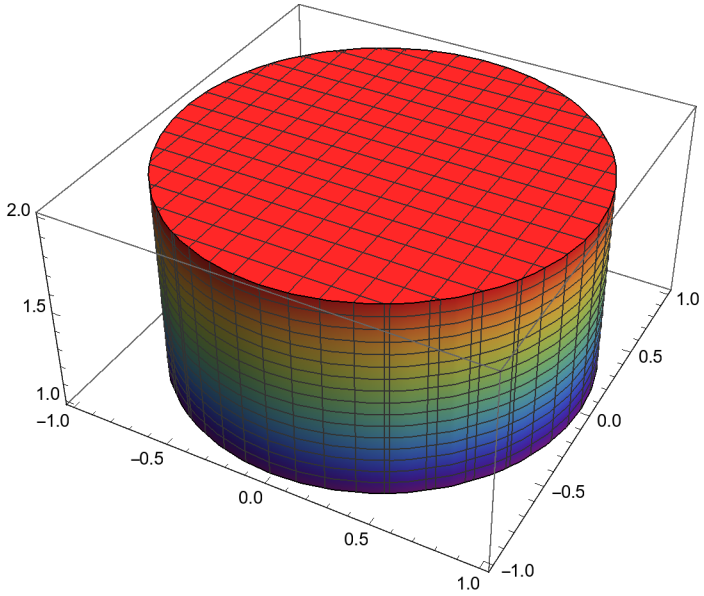
```
SetOptions[RegionPlot3D(*Or whichever plot you desire*),
  ColorFunction → "Rainbow"(*One of many options*)];
(*SetOptions[RegionPlot3D(*Or whichever plot you desire*),
  ColorFunction→Function[{x,y,z},Hue[z]]];*)


(*1*)

RegionPlot3D[x < ArcTan[y] && z < 6 x / (1 + y^2),
 {x, 0, 1}, {y, 0, 1}, {z, 0, 3}, BoxRatios → Automatic]
```



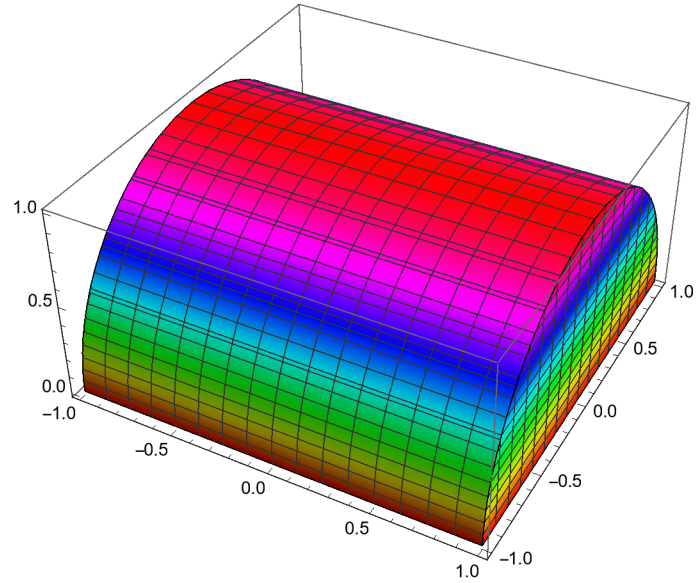

```
(*2a*)
```

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




```
(*2b*)
```

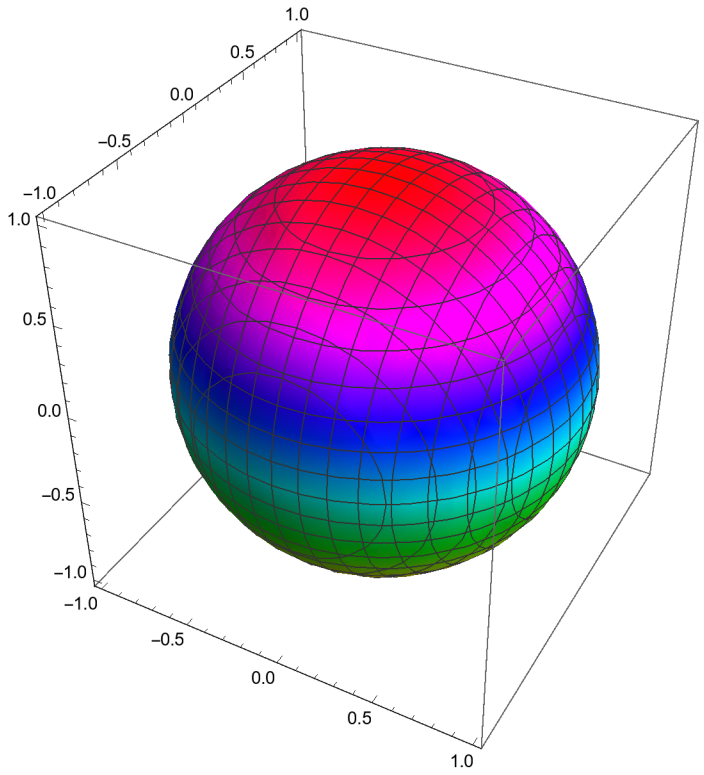
```
RegionPlot3D[1 > z^2 + y^2, {x, -1, 1}, {y, -1, 1}, {z, 0, 1},
 BoxRatios → Automatic, ColorFunction → Function[{x, y, z}, Hue[z]]]
```




```
(*2c*)
```

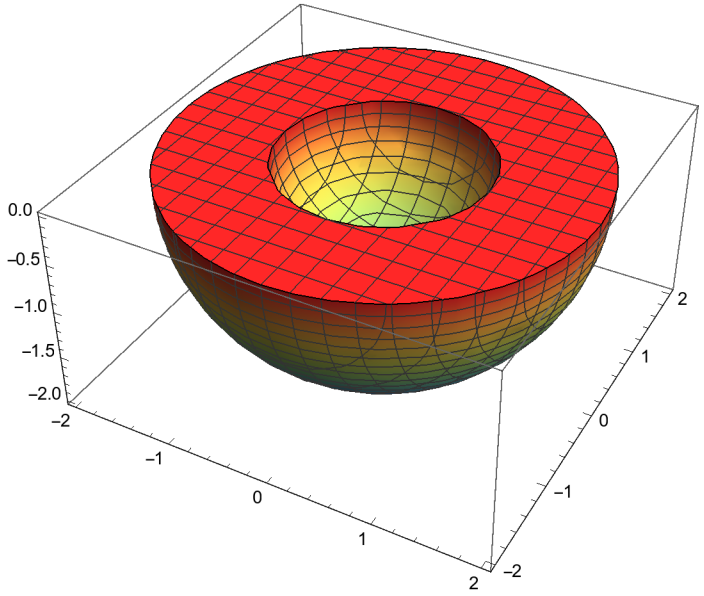
In[1]:=
```
RegionPlot3D[1 > x^2 + z^2 + y^2, {x, -1, 1}, {y, -1, 1}, {z, -1, 1},
 BoxRatios → Automatic, ColorFunction → Function[{x, y, z}, Hue[z]]]
```

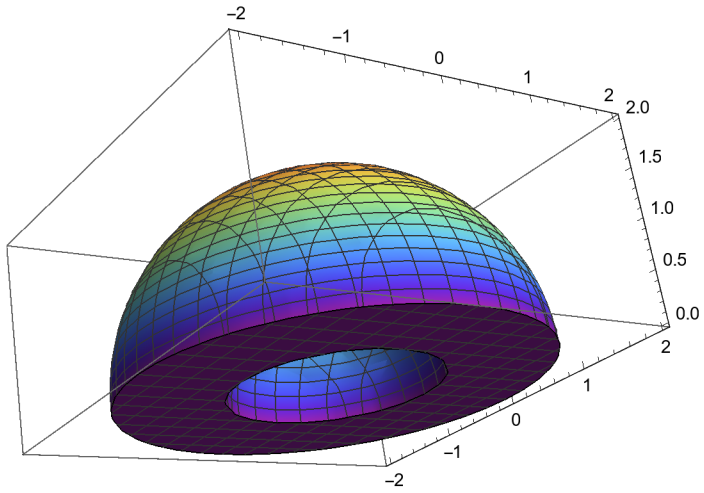
Out[1]=




```
(*2d*)
```

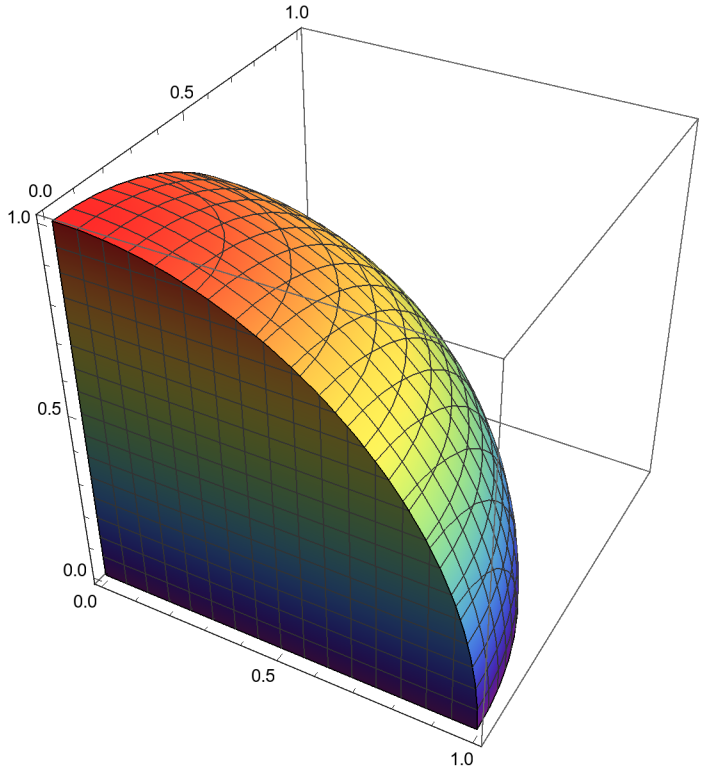
```
RegionPlot3D[4 > z^2 + y^2 + x^2 > 1, {x, -2, 2},
 {y, -2, 2}, {z, -2, 0}, BoxRatios → Automatic]
RegionPlot3D[4 > z^2 + y^2 + x^2 > 1, {x, -2, 2},
 {y, -2, 2}, {z, 0, 2}, BoxRatios → Automatic]
```





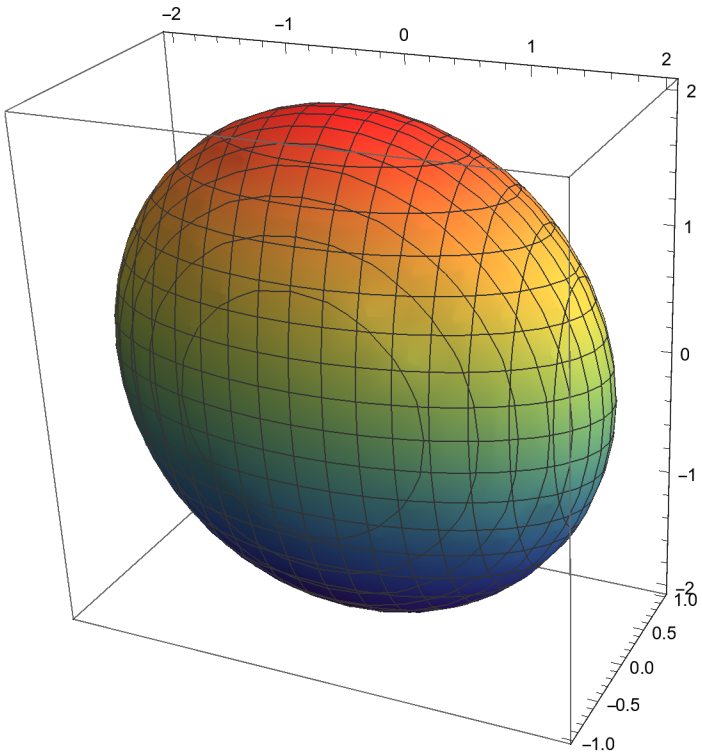

```
(*2e*)
```

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



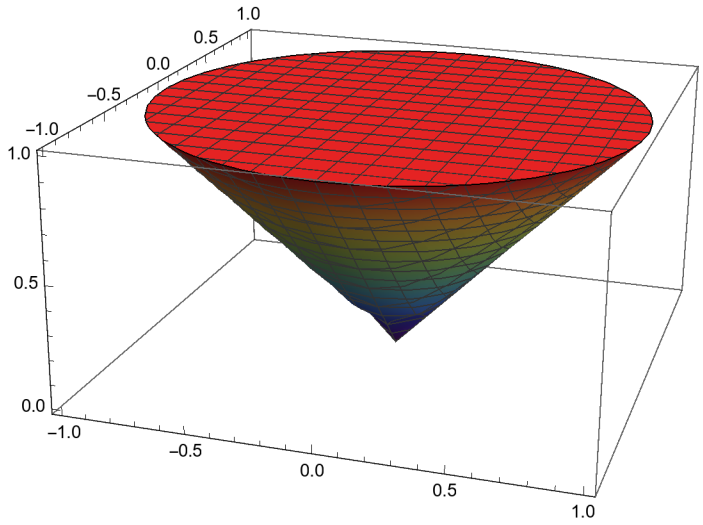

```
(*2f*)
```

```
RegionPlot3D[4 > z^2 + x^2 + 4 y^2, {x, -2, 2},
 {y, -1, 1}, {z, -2, 2}, BoxRatios → Automatic]
```

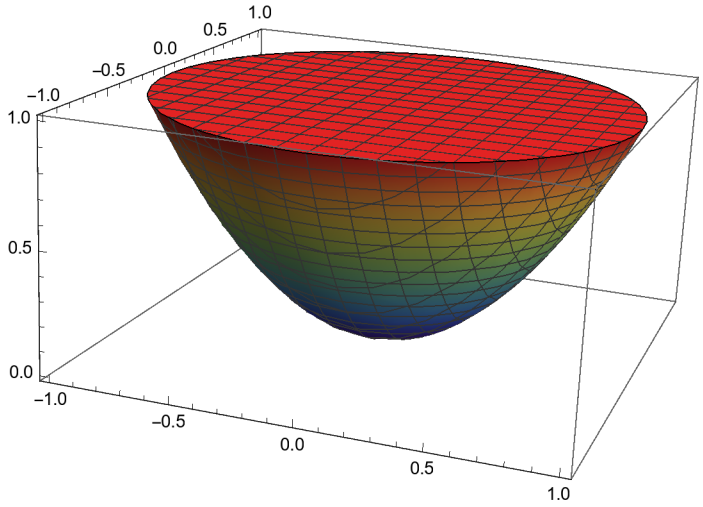



```
(*2g*)
```

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

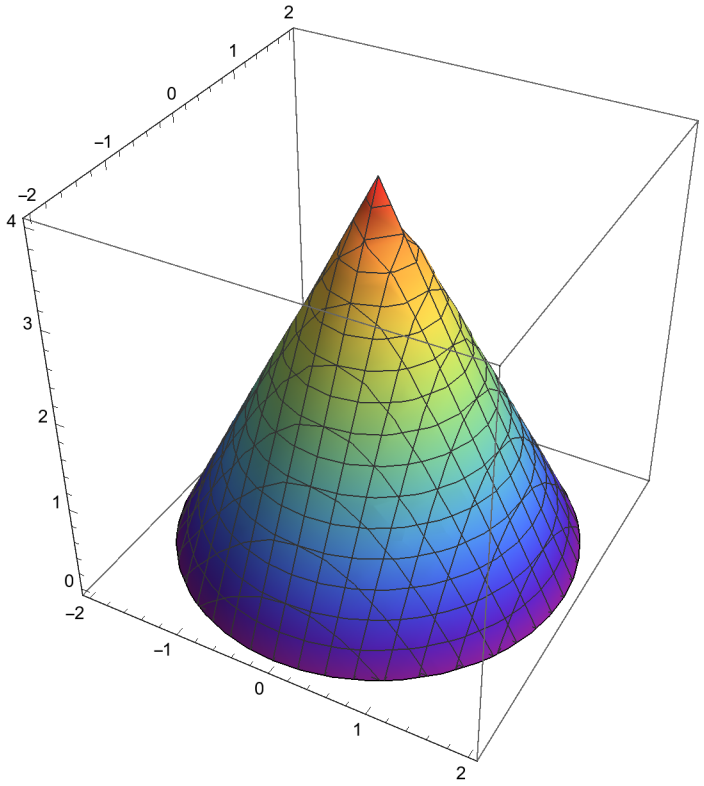


```
(*2h*)
RegionPlot3D[z > x^2 + y^2, {x, -1, 1}, {y, -1, 1}, {z, 0, 1}, BoxRatios → Automatic]
```



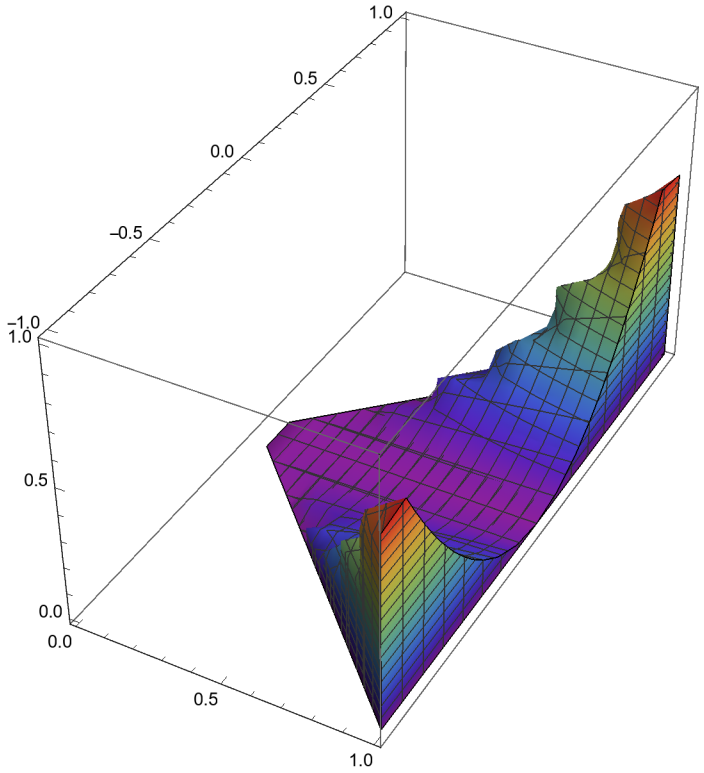

```
(*2i*)
```

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

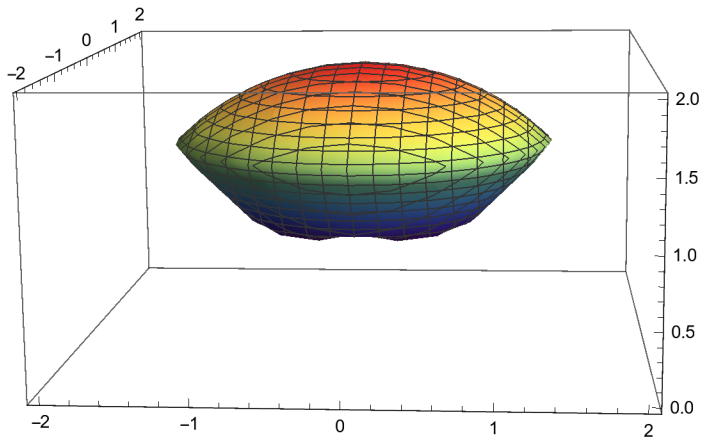



```
(*2j*)
```

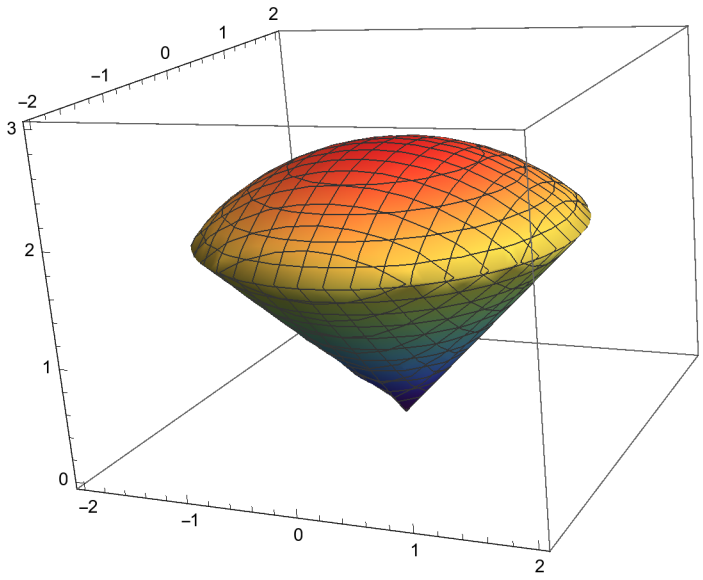
```
RegionPlot3D[z < x * y^2 && x > Abs[y],
 {x, 0, 1}, {y, -1, 1}, {z, 0, 1}, BoxRatios → Automatic]
```




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

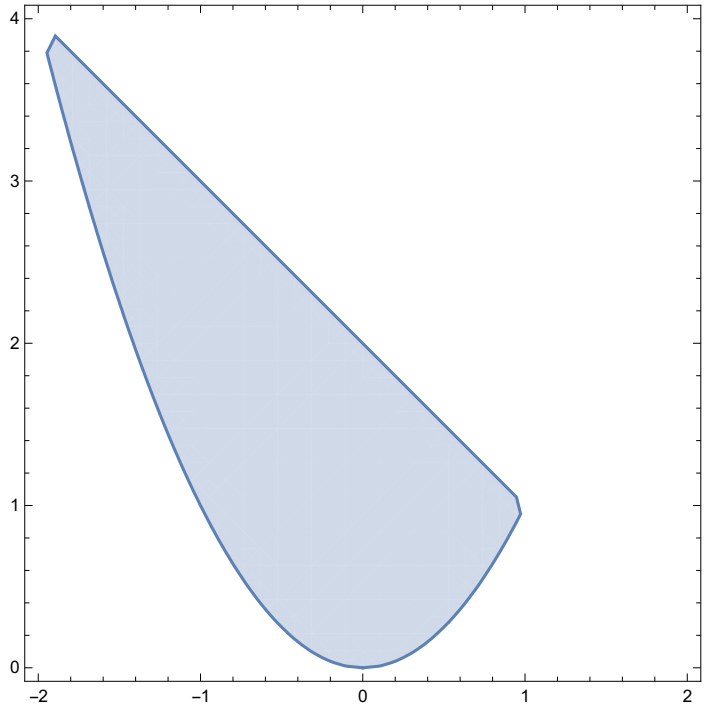


```
(*4*)

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]
```

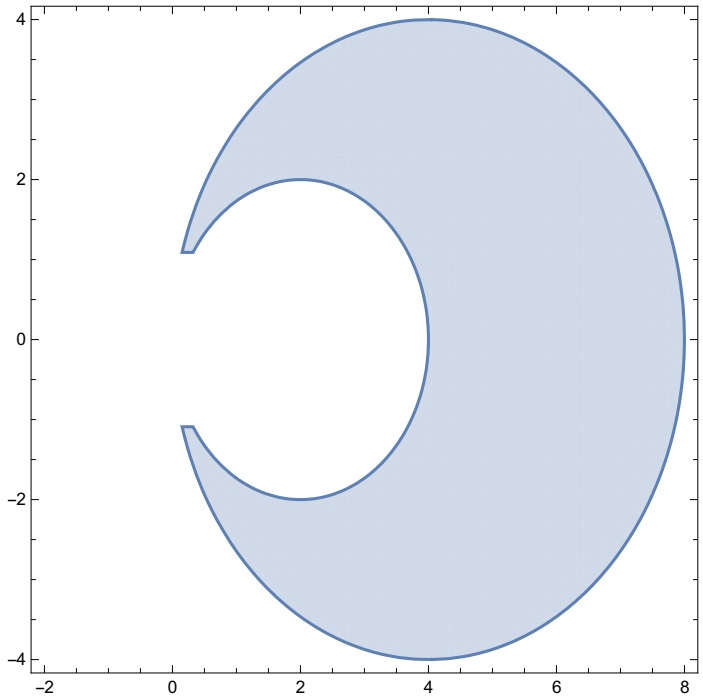


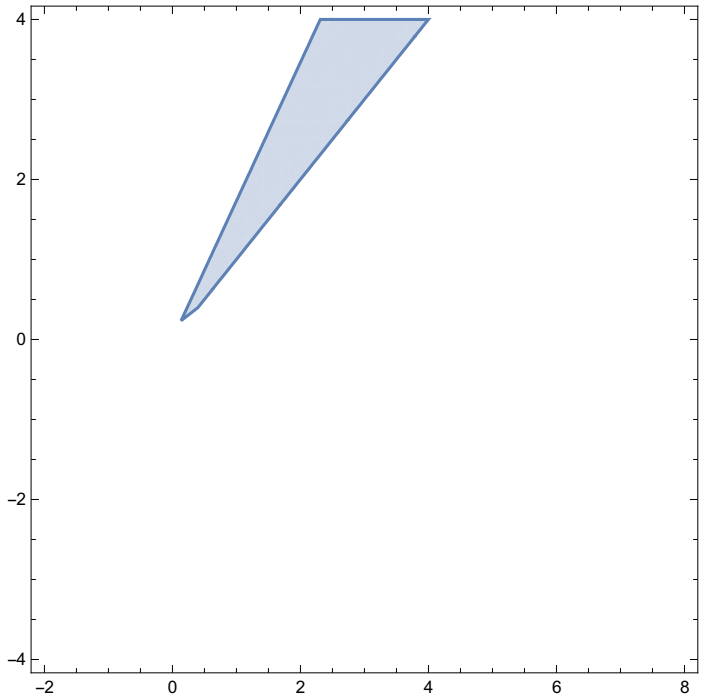

```
(*7*)
```

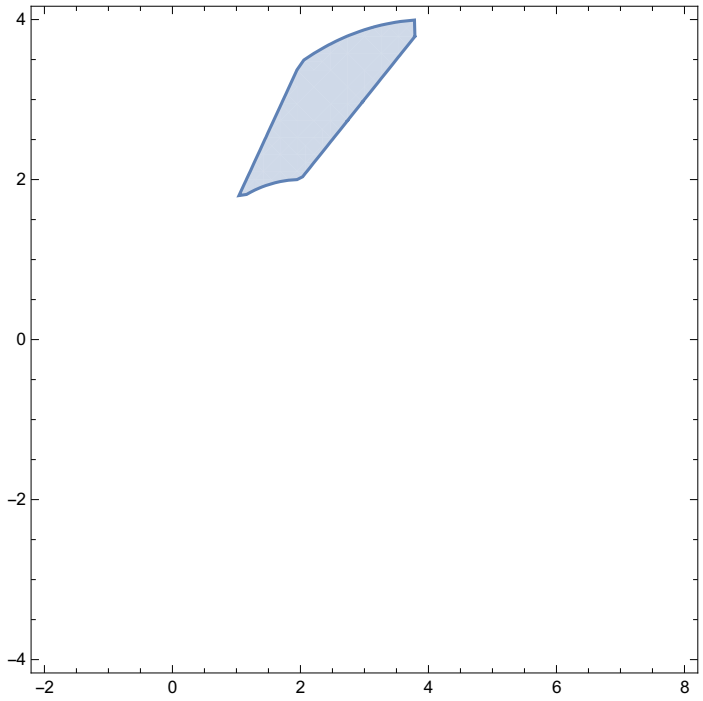
```
RegionPlot[y > x^2 && x + y < 2, {x, -2, 2}, {y, 0, 4}]
```




```
(*10*)

RegionPlot[x^2 + y^2 > 4 x && x^2 + y^2 < 8 x , {x, -2, 8}, {y, -4, 4}]
RegionPlot[y > x && y < Sqrt[3] x, {x, -2, 8}, {y, -4, 4}]
RegionPlot[x^2 + y^2 > 4 x && x^2 + y^2 < 8 x && y > x && y < Sqrt[3] x,
 {x, -2, 8}, {y, -4, 4}]
```


4
2
0
−2
−4
−2
0
2
4
6
8


4
2
0
−2
−4
−2
0
2
4
6
8




```
(*11*)
RegionPlot3D[x + y < 3, {x, 0, 3}, {y, 0, 3}, {z, 0, 4}]
```