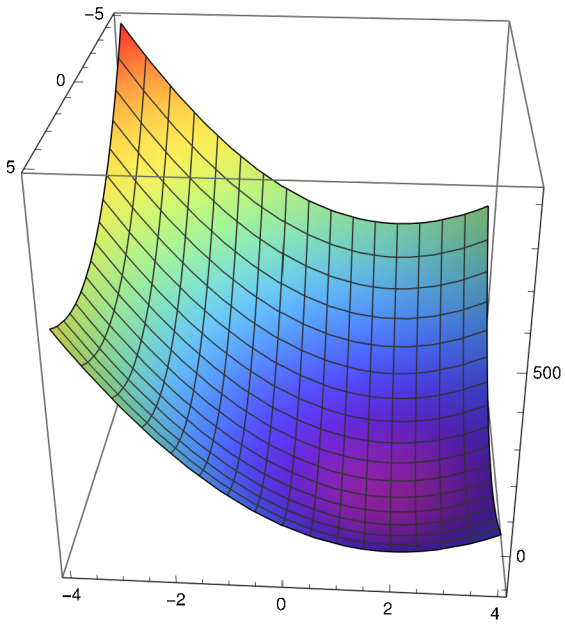
In[5]:=
```
SetOptions[Plot3D(*Or whichever plot you desire*),
  ColorFunction → "Rainbow"(*One of many options*)];
```

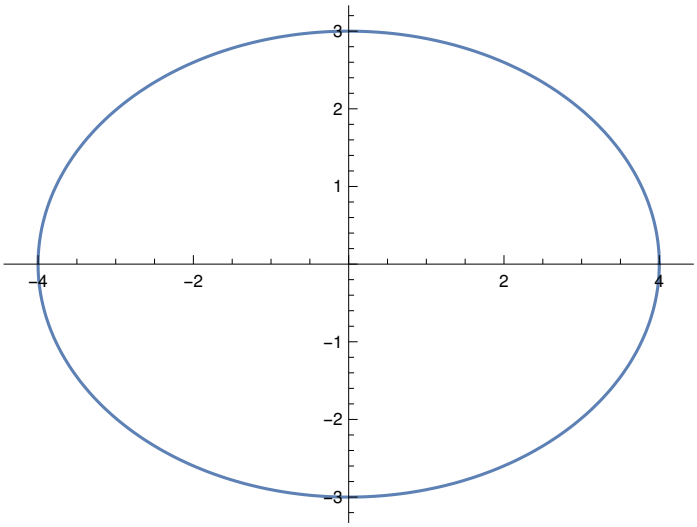
(Ukazka 1)

In[ ]:=
```
Plot3D[9 x^2 - 36 x + 16 y^2 - 64 y, {x, -5, 5}, {y, -4, 4}, BoxRatios → {1, 1, 1}]
ParametricPlot[{4 Cos[u], 3 Sin[u]}, {u, 0, 2 Pi}]
ParametricPlot3D[
 {4 Cos[u], 3 Sin[u], 9 (4 Cos[u])^2 - 36 (4 Cos[u]) + 16 (3 Sin[u])^2 - 64 (3 Sin[u])},
 {u, 0, 2 Pi}, BoxRatios → {1, 1, 1}]
```

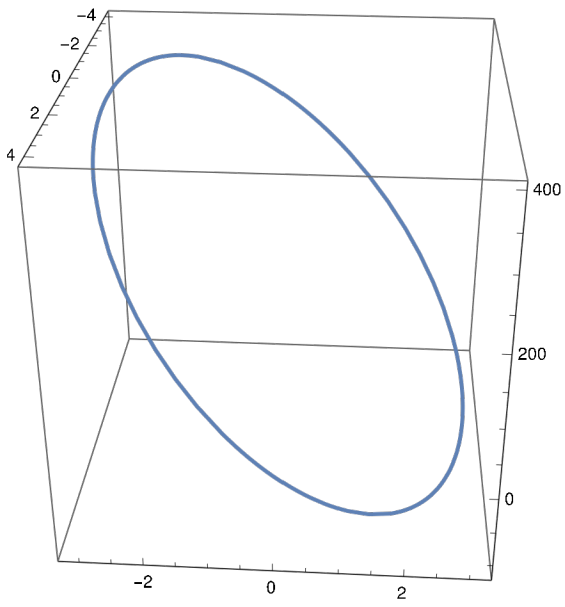
Out[ ]=



Out[ ]=

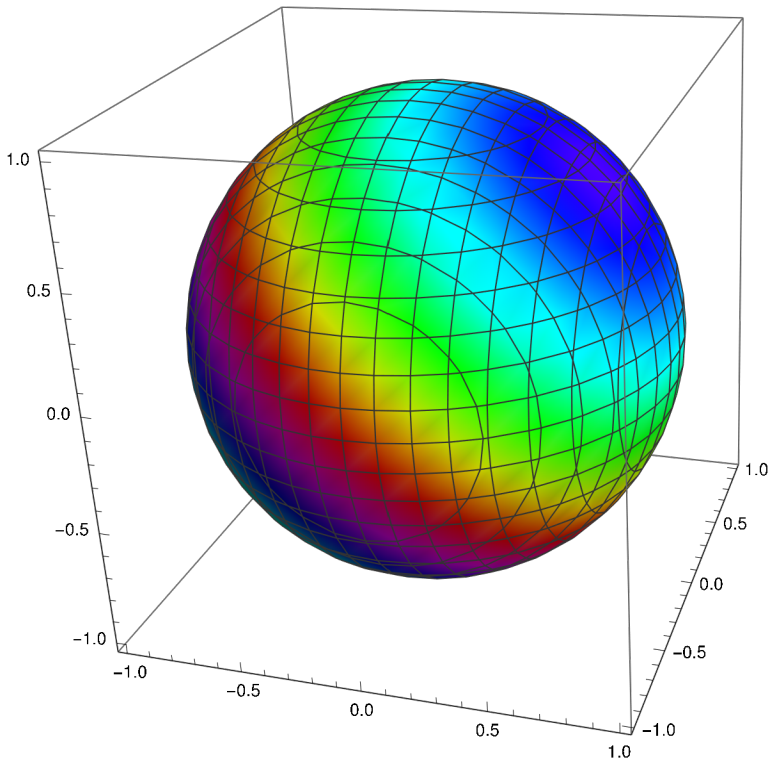


Out[ ]=



In[ ]:=
```
ContourPlot3D[x^2 + y^2 + z^2 == 1, {x, -1, 1}, {y, -1, 1}, {z, -1, 1},
 BoxRatios → Automatic, ColorFunction → Function[{x, y, z}, Hue[z + x]]]
```

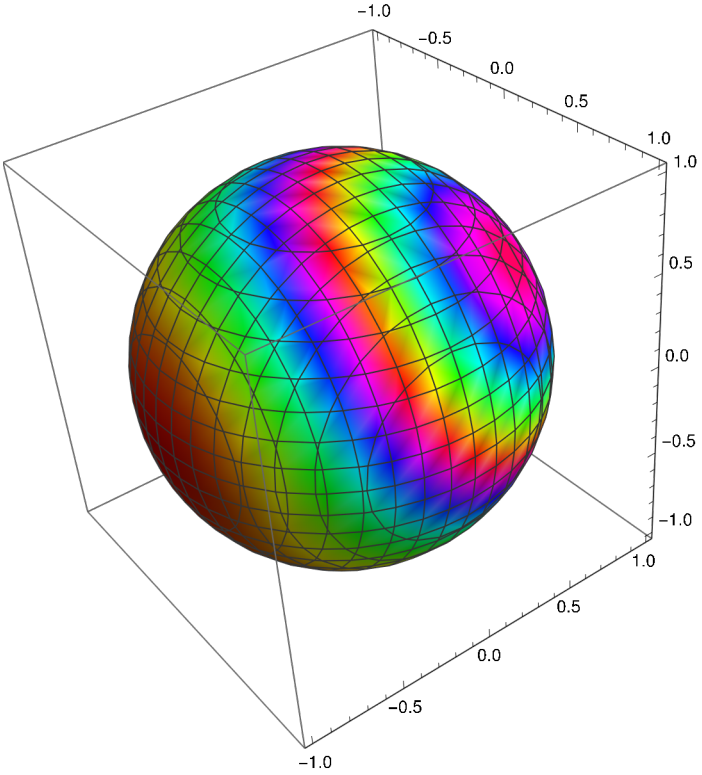
Out[ ]=



(*Ukazka 2*)

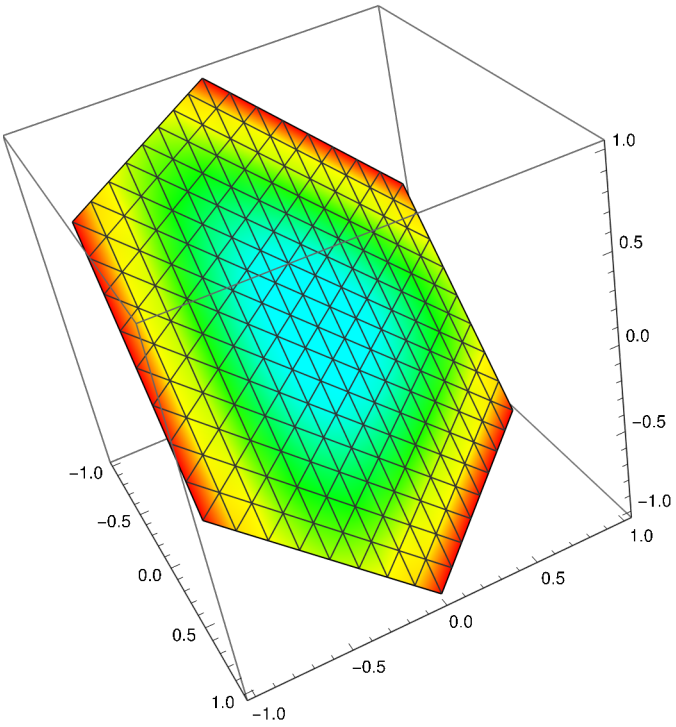
In[ ]:=
```
ContourPlot3D[x^2 + y^2 + z^2 == 1, {x, -1, 1}, {y, -1, 1}, {z, -1, 1},
 BoxRatios → Automatic, ColorFunction → Function[{x, y, z}, Hue[x * y * z * 4]]]
```

Out[ ]=



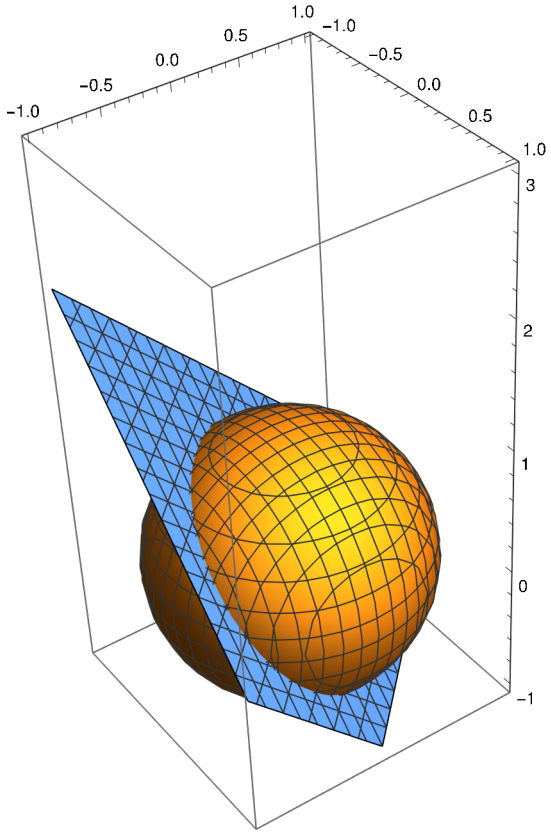
In[ ]:=
```
ContourPlot3D[x + y + z == 0, {x, -1, 1}, {y, -1, 1}, {z, -1, 1},
 BoxRatios → Automatic, ColorFunction → Function[{x, y, z}, Hue[x * y * z * 4]]]
```

Out[ ]=



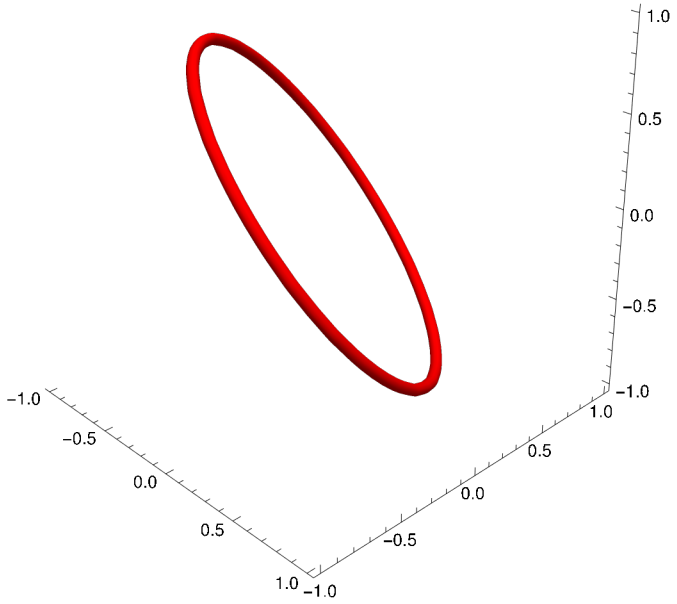
In[ ]:=
```
ContourPlot3D[{x^2 + y^2 + z^2 == 1, x + y + z == 0},
 {x, -1, 1}, {y, -1, 1}, {z, -1, 3}, BoxRatios → Automatic]
```

Out[ ]=



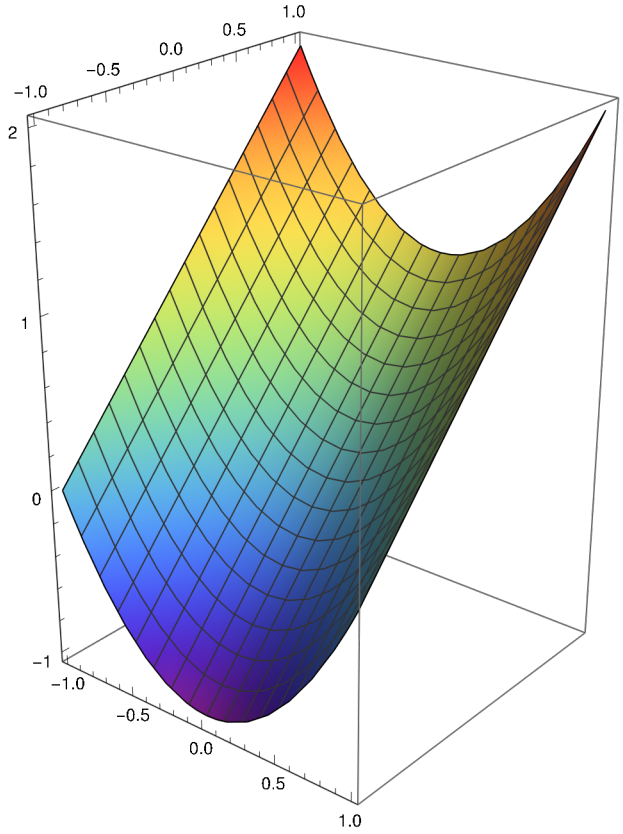
In[ ]:=
```
ContourPlot3D[{x^2 + y^2 + z^2 == 1, x + y + z == 0}, {x, -1, 1},
 {y, -1, 1}, {z, -1, 1}, ContourStyle → Opacity[0], Mesh → None,
 BoundaryStyle → {1 → None, 2 → None, {1, 2} → {{Red, Tube[.03]}}}, Boxed → False]
```

Out[ ]=

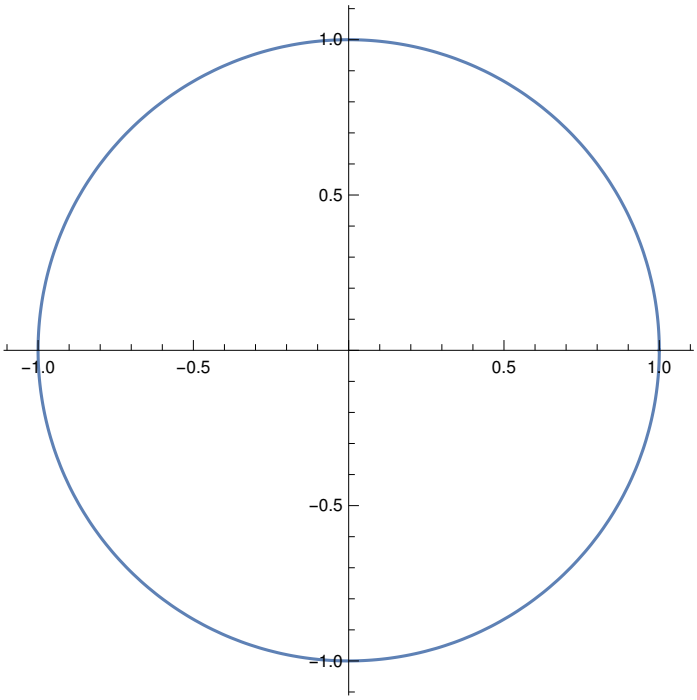


(1 a)

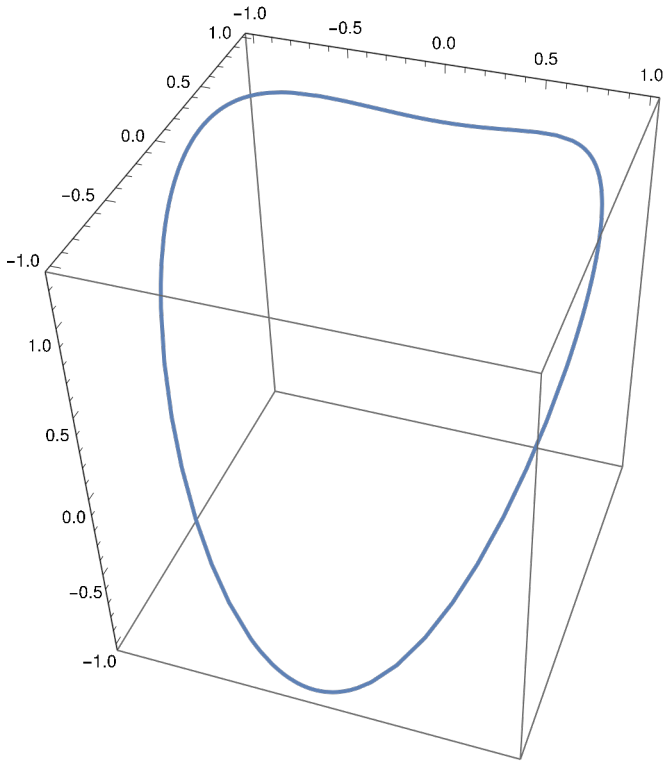
```
Plot3D[x^2 + y, {x, -1, 1}, {y, -1, 1}, BoxRatios → Automatic]
```




```
ParametricPlot[{Cos[u], Sin[u]}, {u, 0, 2 Pi}]
```

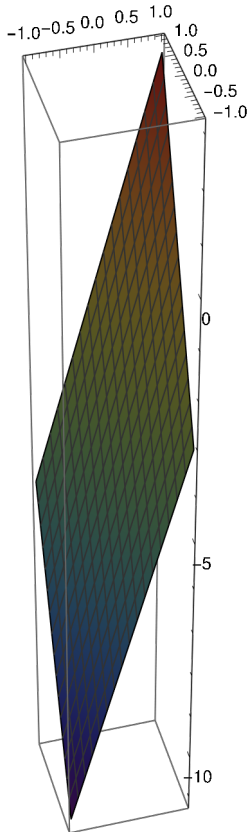


```
ParametricPlot3D[{Cos[u], Sin[u], (Cos[u])^2 + Sin[u]}, {u, 0, 2 Pi}, BoxRatios → Automatic]
```

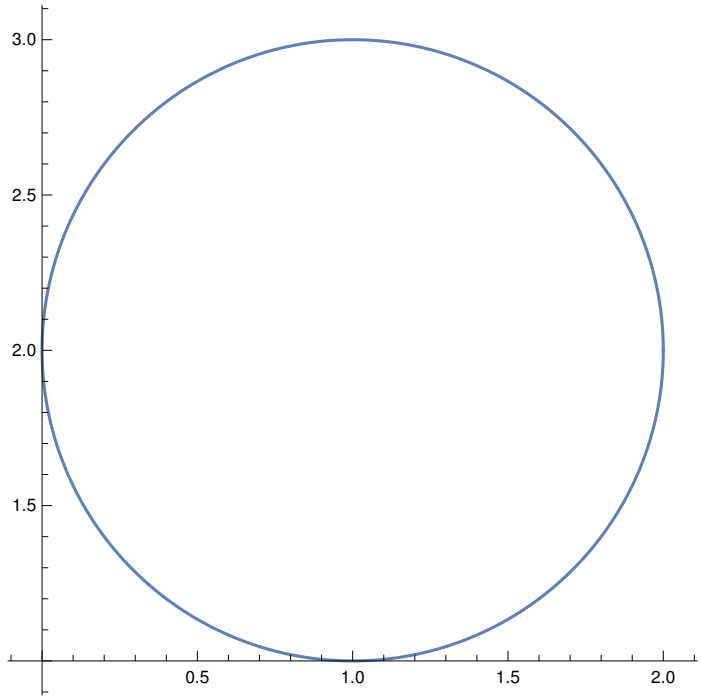


(b)

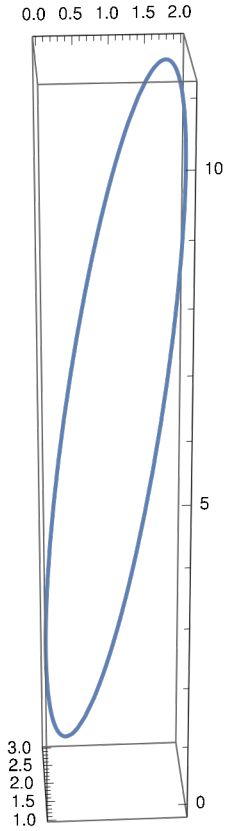
```
Plot3D[4 x + 3 y - 4, {x, -1, 1}, {y, -1, 1}, BoxRatios → Automatic]
```




```
ParametricPlot[{1 + Cos[u], 2 + Sin[u]}, {u, 0, 2 Pi}]
```



```
ParametricPlot3D[{1 + Cos[u], 2 + Sin[u], 4 + 4 Cos[u] + 6 + 3 Sin[u] - 4},
 {u, 0, 2 Pi}, BoxRatios → Automatic]
```



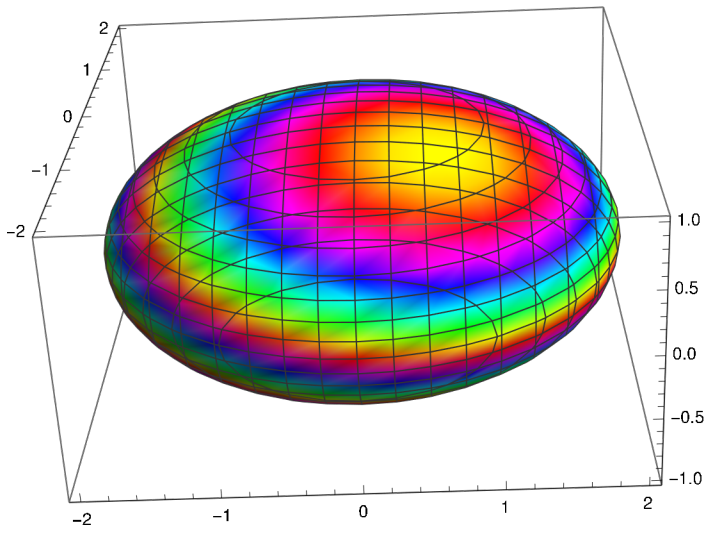
In[ ]:= **(d)**

```
ContourPlot3D[x^2 + y^2 + 4 z^2 == 4, {x, -2, 2}, {y, -2, 2}, {z, -1, 1},
 BoxRatios → Automatic, ColorFunction → Function[{x, y, z}, Hue[x - y + 3 z]]]
```

Out[ ]=

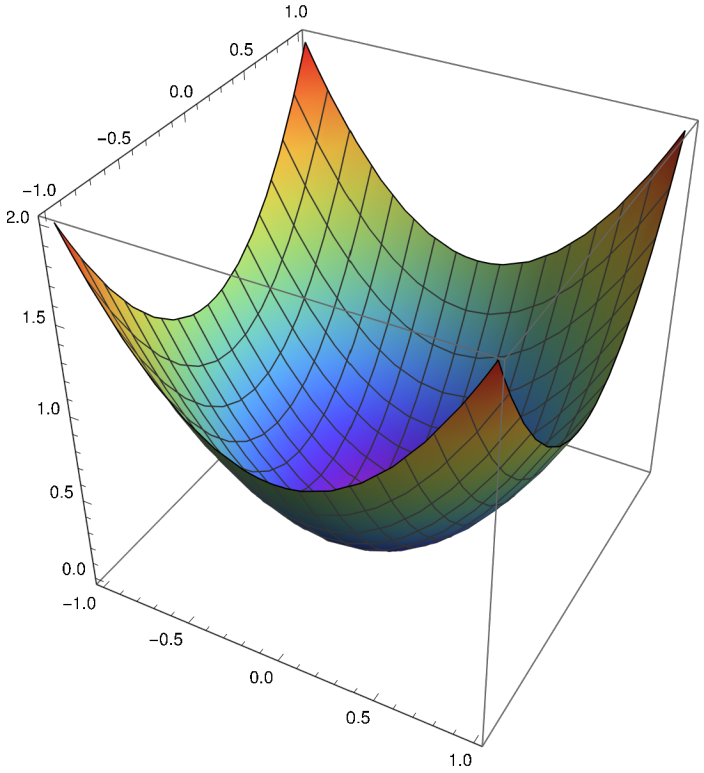
d

Out[ ]=

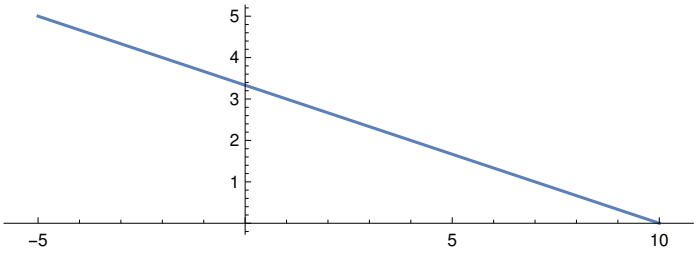


(c)

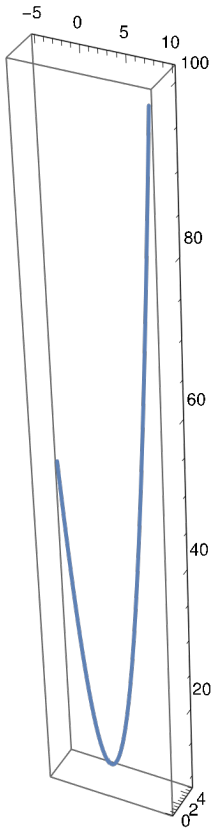
```
Plot3D[x^2 + y^2, {x, -1, 1}, {y, -1, 1}, BoxRatios → Automatic]
```




```
ParametricPlot[{u, (20 - 2 u) / 6}, {u, -5, 10}]
```



```
ParametricPlot3D[{u, (20 - 2 u) / 6, u^2 + (20 - 2 u)^2 / 36},
 {u, -5, 10}, BoxRatios → Automatic]
```



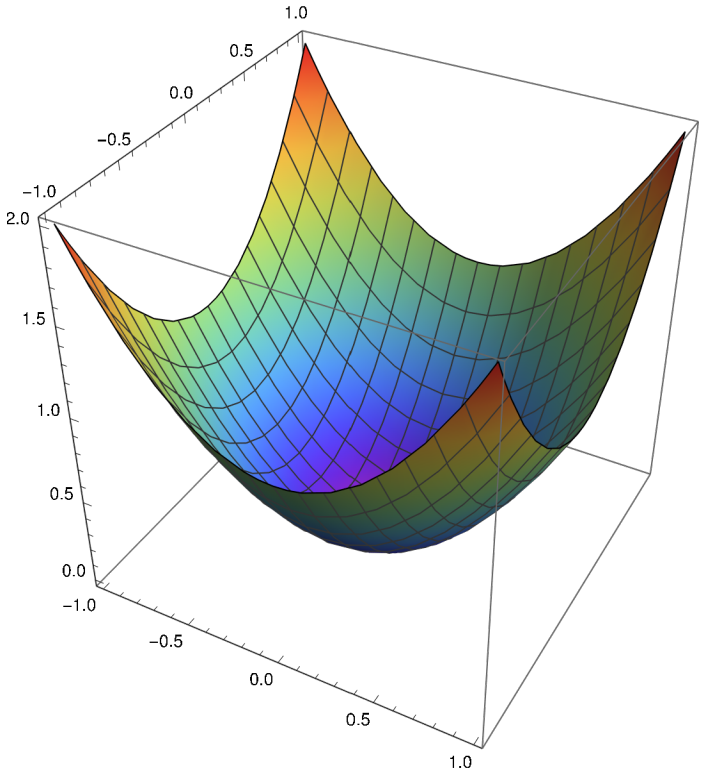
(d)

```
Plot3D[x^2 + y^2, {x, -1, 1}, {y, -1, 1}, BoxRatios → Automatic]
```

Out[ ]=

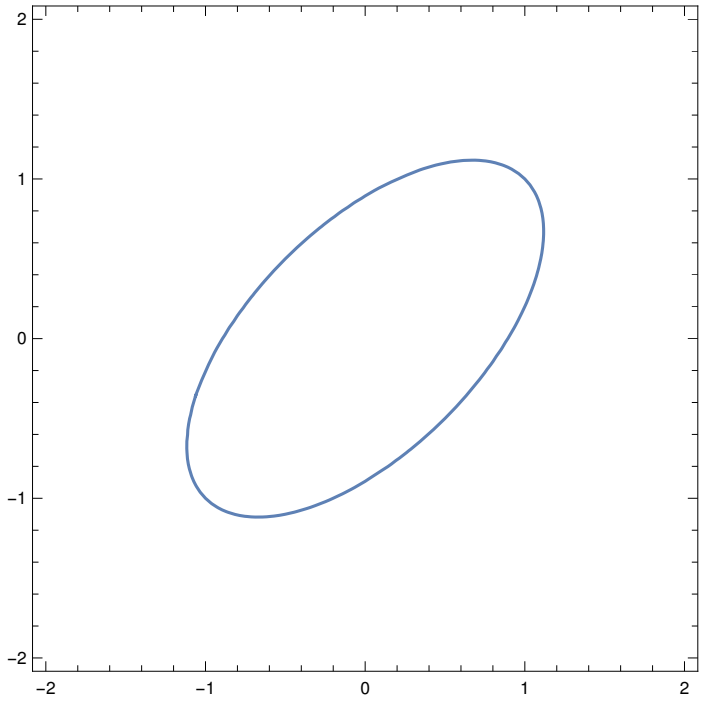
g

Out[ ]=



In[ ]:=
```
ContourPlot[5 x^2 - 6 x * y + 5 y^2 - 4 == 0, {x, -2, 2}, {y, -2, 2}]
```

Out[ ]=



In[1]:=
```
ContourPlot3D[{x^2 + y^2 = z, 5 x^2 - 6 x * y + 5 y^2 - 4 == 0},
 {x, -2, 2}, {y, -2, 2}, {z, -1, 3}, ContourStyle → Opacity[0], Mesh → None,
 BoundaryStyle → {1 → None, 2 → None, {1, 2} → {{Green, Tube[.03]}}}, Boxed → False]
```

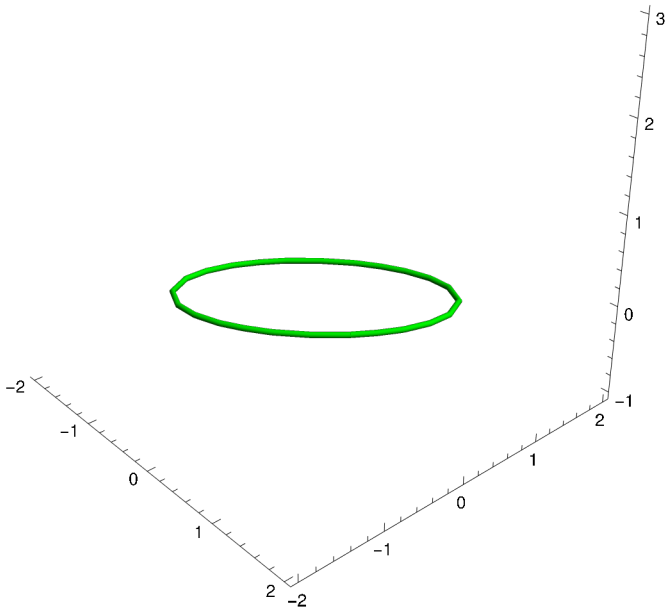
Set: Tag Plus in $x^2 + y^2$ is Protected.

Set: Tag Plus in $x^2 + y^2$ is Protected.

Set: Tag Plus in $x^2 + y^2$ is Protected.

General: Further output of Set::write will be suppressed during this calculation.

Out[1]=

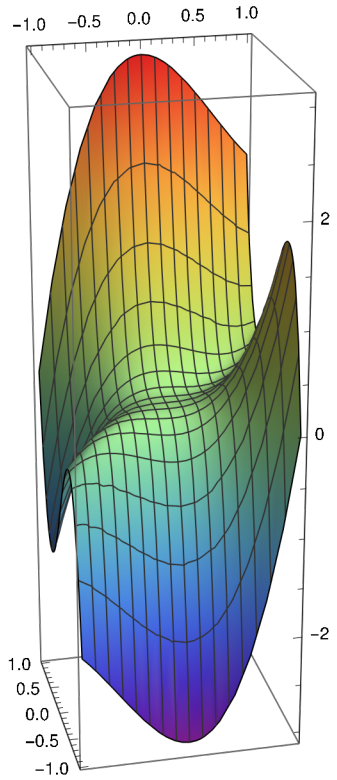


In[46]:=
```
(2 a)
Plot3D[x^3 - 2 x^2 y + 3 y^3, {x, -1, 1}, {y, -1, 1}, BoxRatios → Automatic]
RegionPlot[Abs[x] < 1 && Abs[y] < 1, {x, -2, 2}, {y, -2, 2}]
```

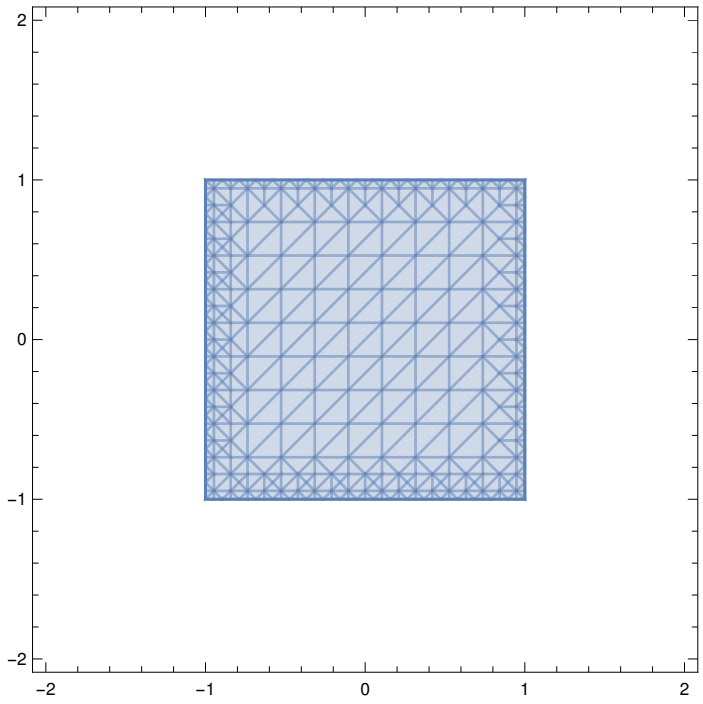
Out[46]=

2 a

Out[47]=



Out[48]=

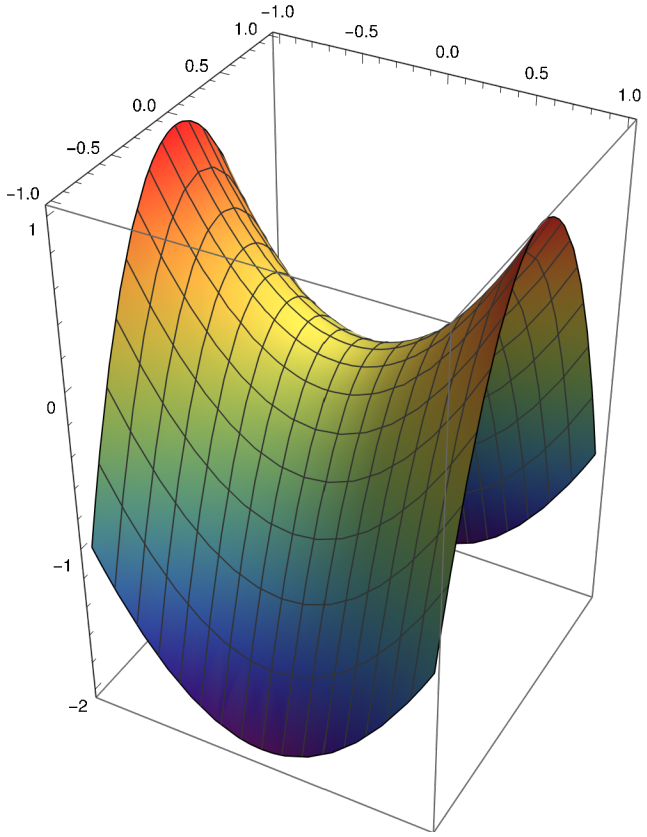


In[49]:=
```
(2 b)
Plot3D[x^2 - 3 y^2 + y * y, {x, -1, 1}, {y, -1, 1}, BoxRatios → Automatic]
RegionPlot[Abs[x] < 1 && Abs[y] < 1, {x, -2, 2}, {y, -2, 2}]
```

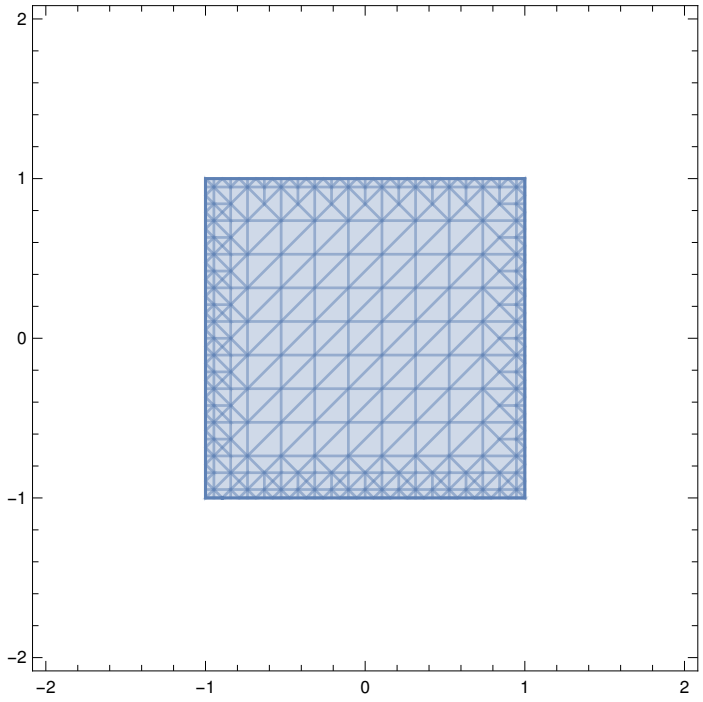
Out[49]=

2 b

Out[50]=



Out[51]=



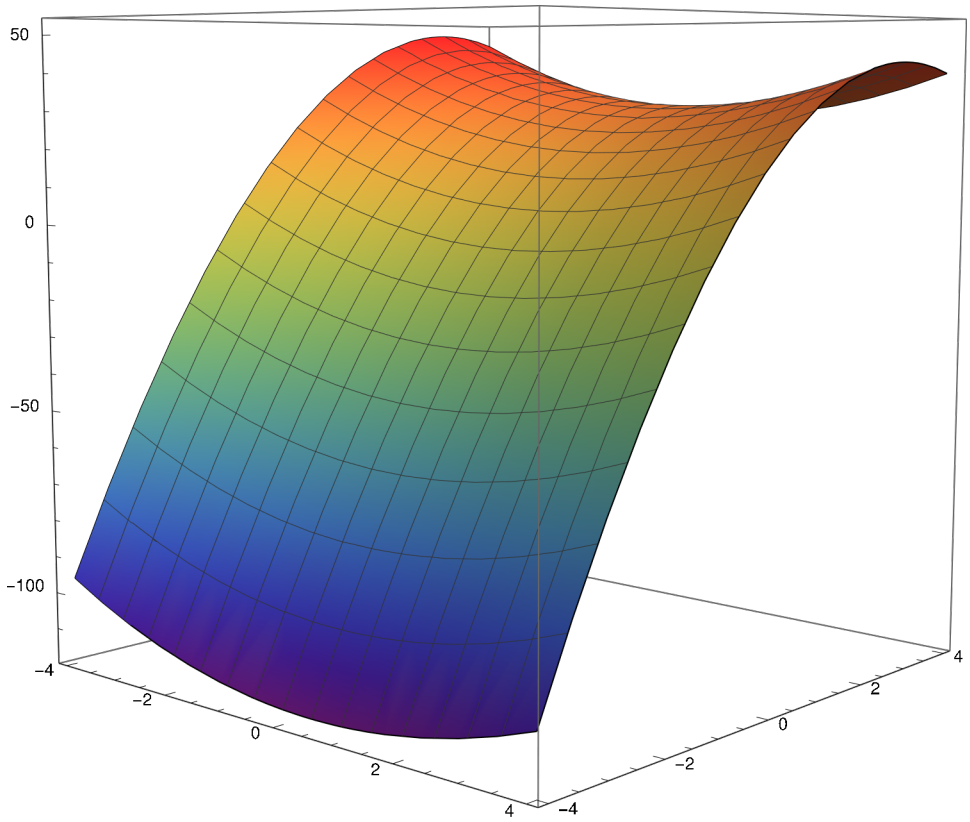
In[88]:=

```
(2 c)
Plot3D[x^2 - 3 y^2 - x + 18 y + 4, {x, -4, 4}, {y, -4, 4}, BoxRatios → {1, 1, 1}]
RegionPlot[x < y, {x, 0, 4}, {y, 0, 4}]
Plot3D[{x^2 - 3 y^2 - x + 18 y + 4}, {x, 0, 4},
 {y, 0, 4}, RegionFunction → Function[{x, y, z}, x ≤ y]]
```

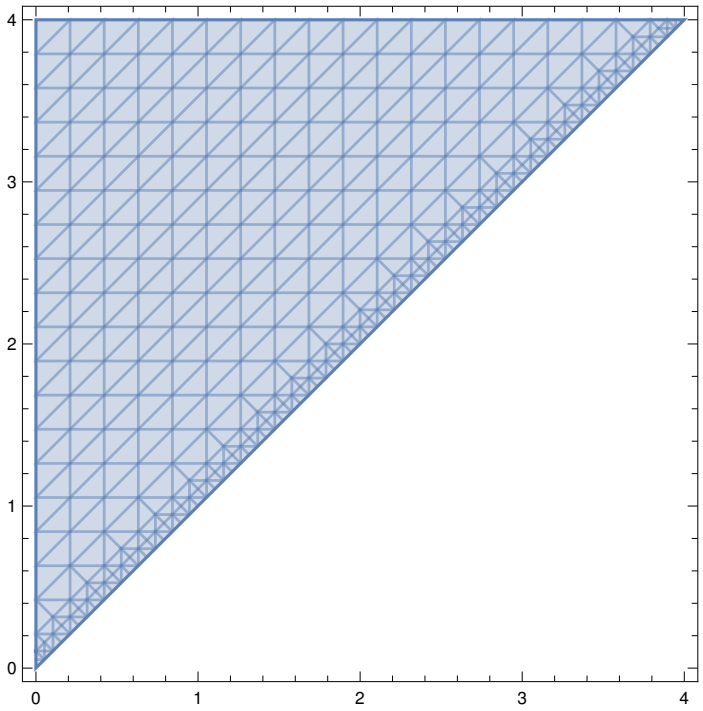
Out[88]=

2 c

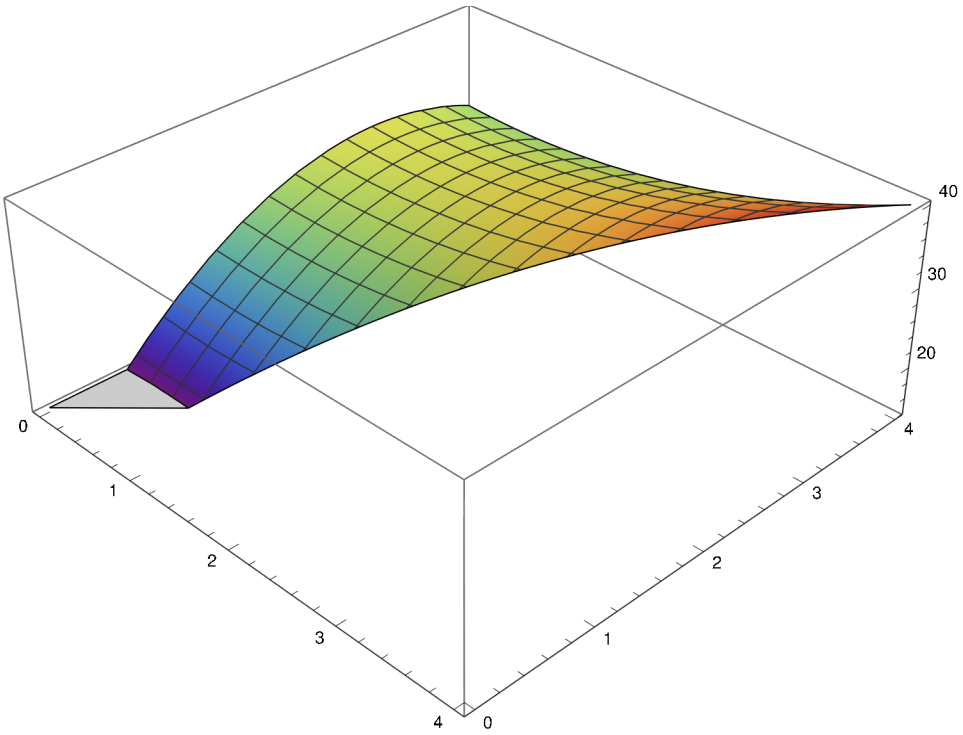
Out[89]=



Out[90]=



Out[91]=



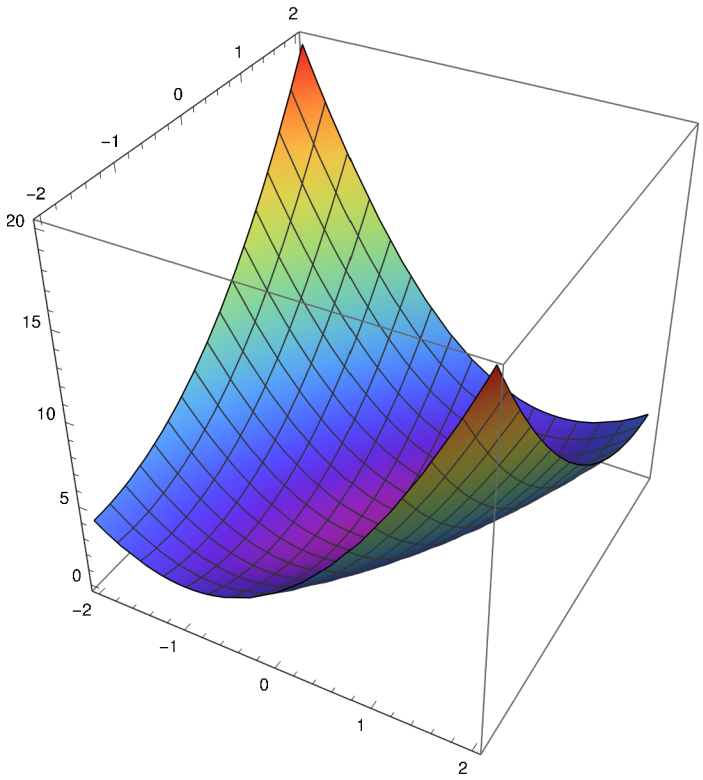
In[112]:=

```
(2 d)
Plot3D[(x - y)^2 + x^2, {x, -2, 2}, {y, -2, 2}, BoxRatios → {1, 1, 1}]
RegionPlot[x < y, {x, -2, 2}, {y, -2, 2}]
Plot3D[{(x - y)^2 + x^2}, {x, -2, 2}, {y, -2, 2},
 RegionFunction → Function[{x, y, z}, Abs[x] + Abs[y] < 2]]
```

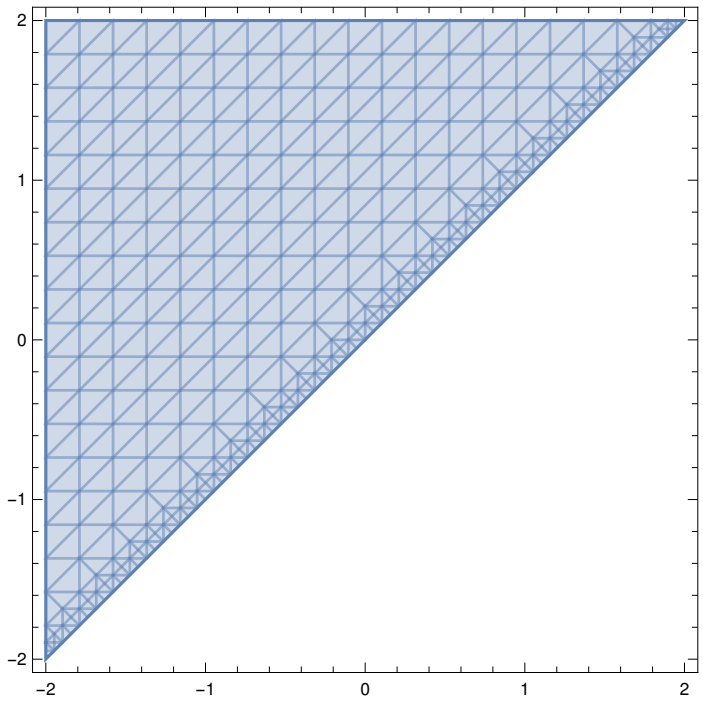
Out[112]=

2 d

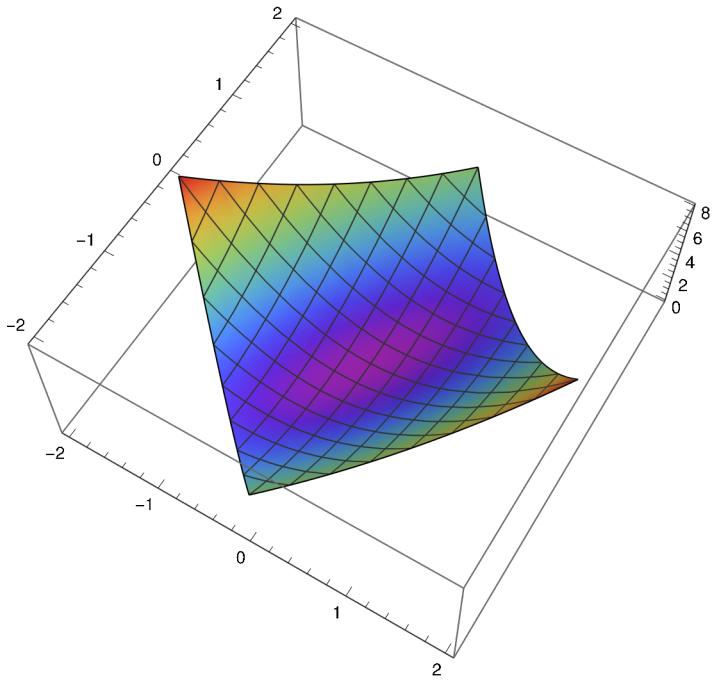
Out[113]=



Out[114]=

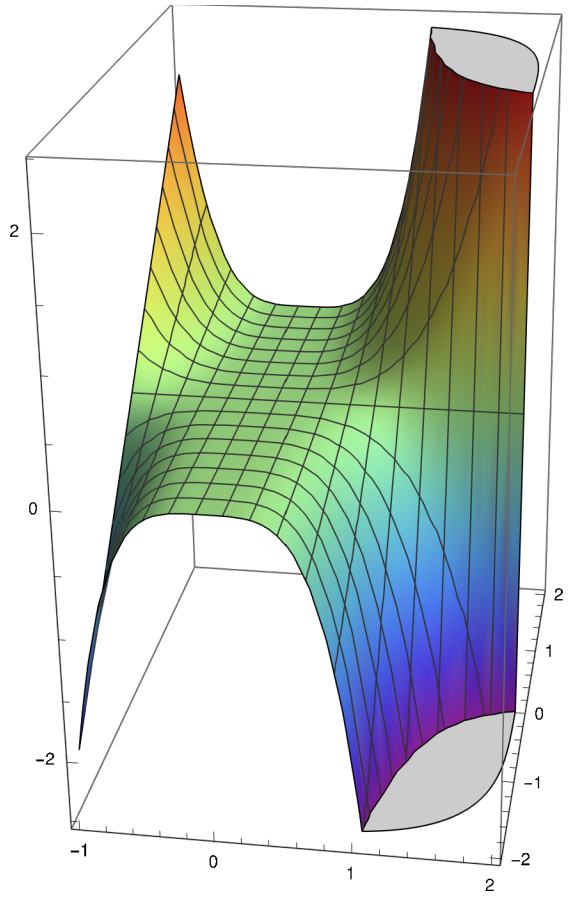


Out[115]=

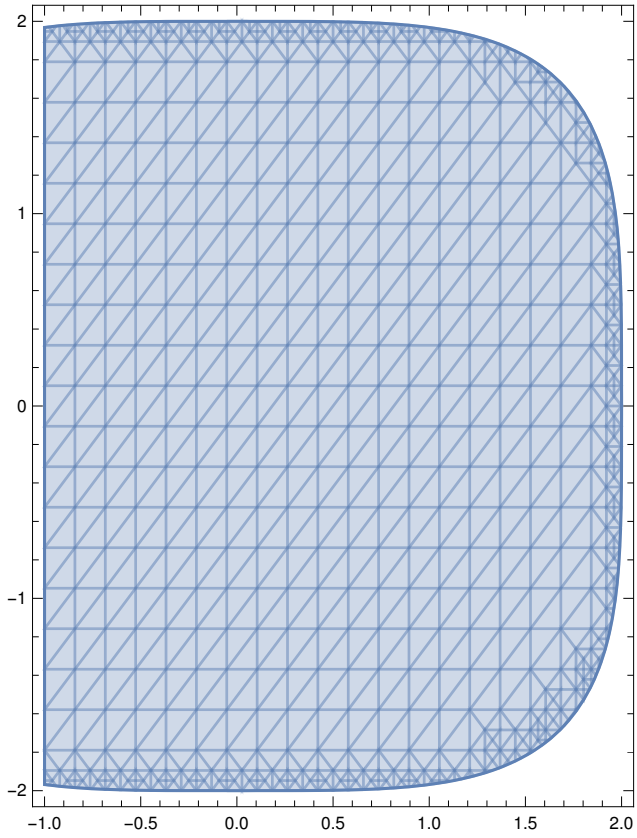


(3 a)

```
Plot3D[{x^4 y}, {x, -1, 2}, {y, -2, 2},
 RegionFunction → Function[{x, y, z}, x^4 + y^4 ≤ 16], BoxRatios → Automatic]
```

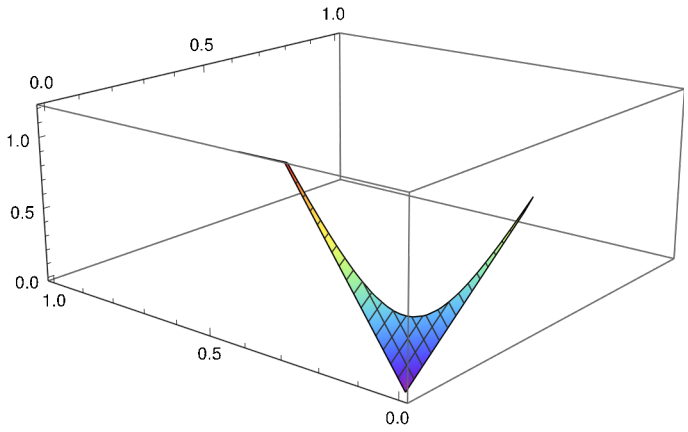


```
RegionPlot[x^4 + y^4 ≤ 16, {x, -1, 2}, {y, -2, 2}, AspectRatio → Automatic]
```

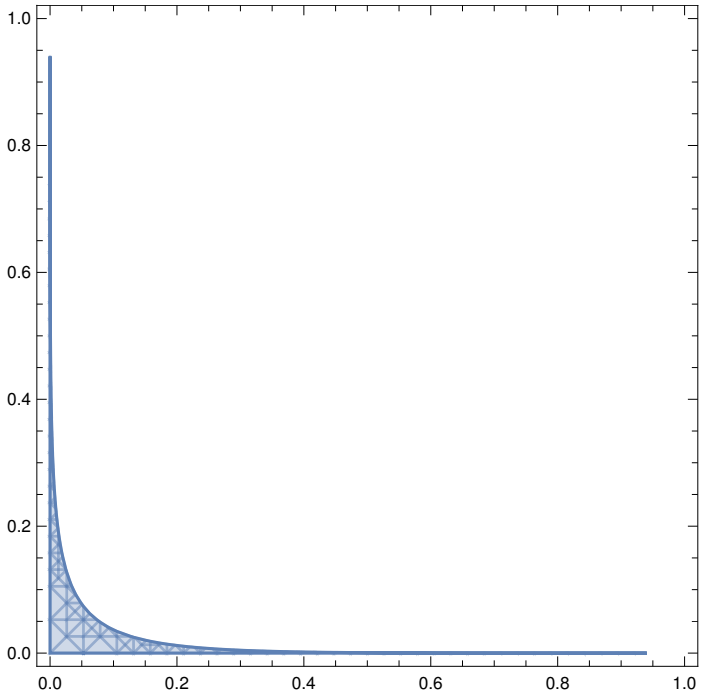


(3 b)

```
Plot3D[{2 x + 4 y}, {x, 0, 1}, {y, 0, 1},
 RegionFunction → Function[{x, y, z}, x^(1 / 4) + y^(1 / 4) ≤ 1]]
```

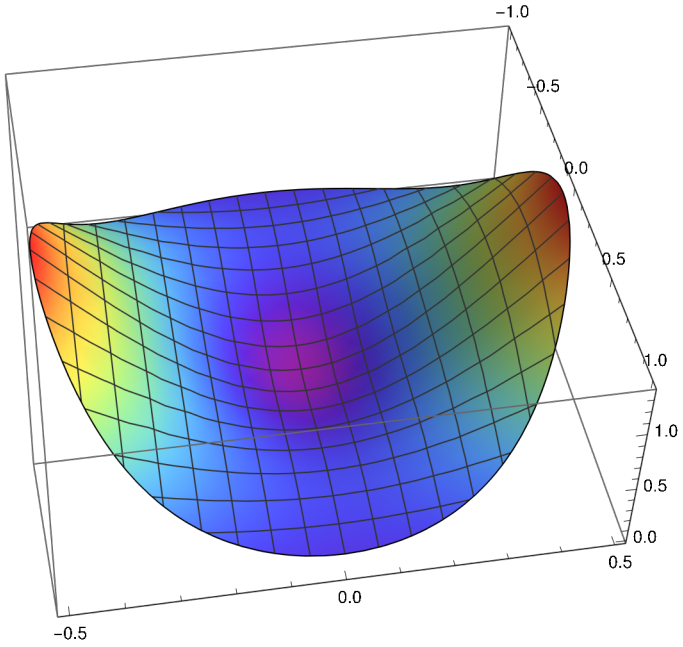



```
RegionPlot[x^(1 / 4) + y^(1 / 4) ≤ 1, {x, 0, 1}, {y, 0, 1}, AspectRatio → Automatic]
```



(c)

```
Plot3D[{(x^2 + 7 y^2) Exp[-2 x^2 - y^2]}, {x, -1, 1},
 {y, -1/2, 1/2}, RegionFunction → Function[{x, y, z}, x^(2) + 4 y^(2) ≤ 1]]
```




```
RegionPlot[x^(2) + 4 y^(2) ≤ 1, {x, -1, 1}, {y, -1/2, 1/2}, AspectRatio → Automatic]
```