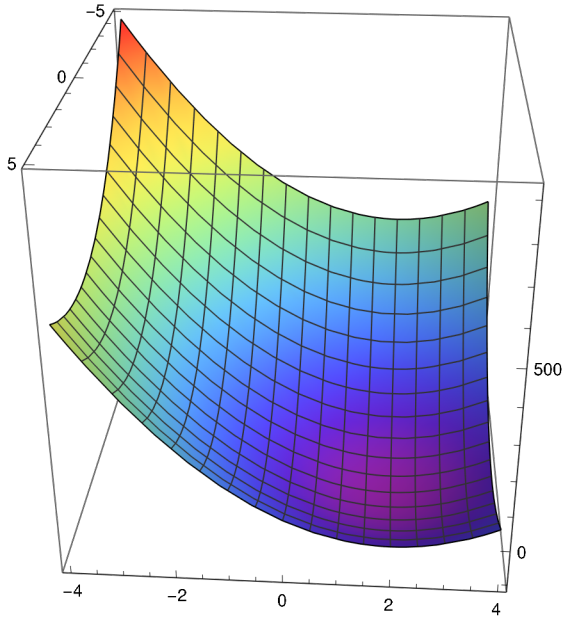
In[3]:=
```
SetOptions[Plot3D(*Or whichever plot you desire*),
  ColorFunction → "Rainbow"(*One of many options*)];
```

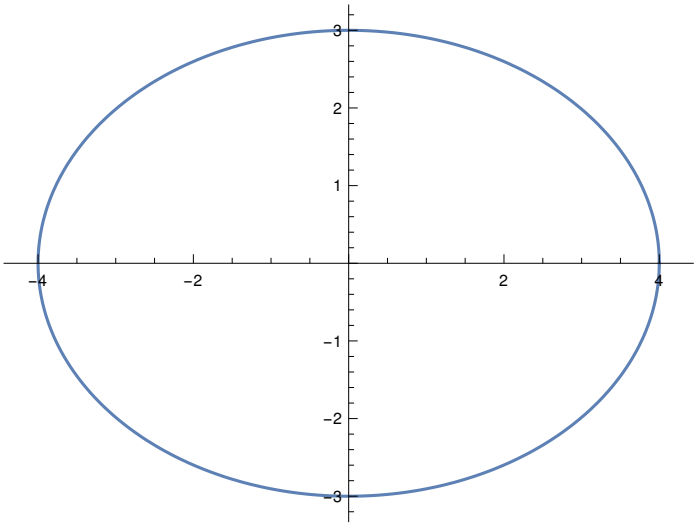
(Ukazka 1)

In[16]:=
```
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}]
```

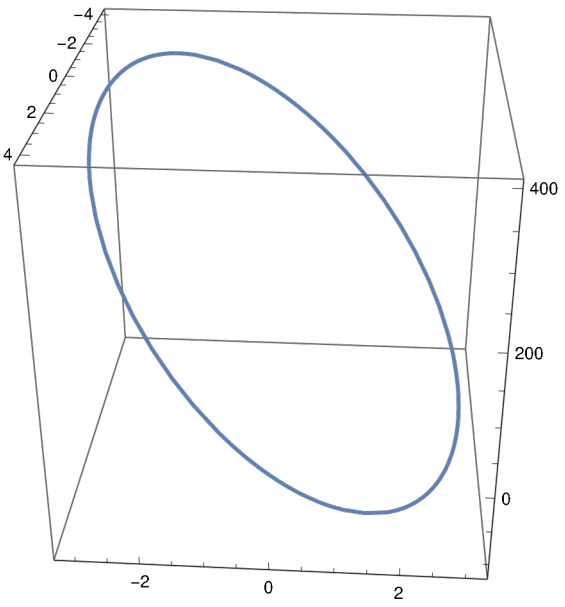
Out[16]=



Out[17]=

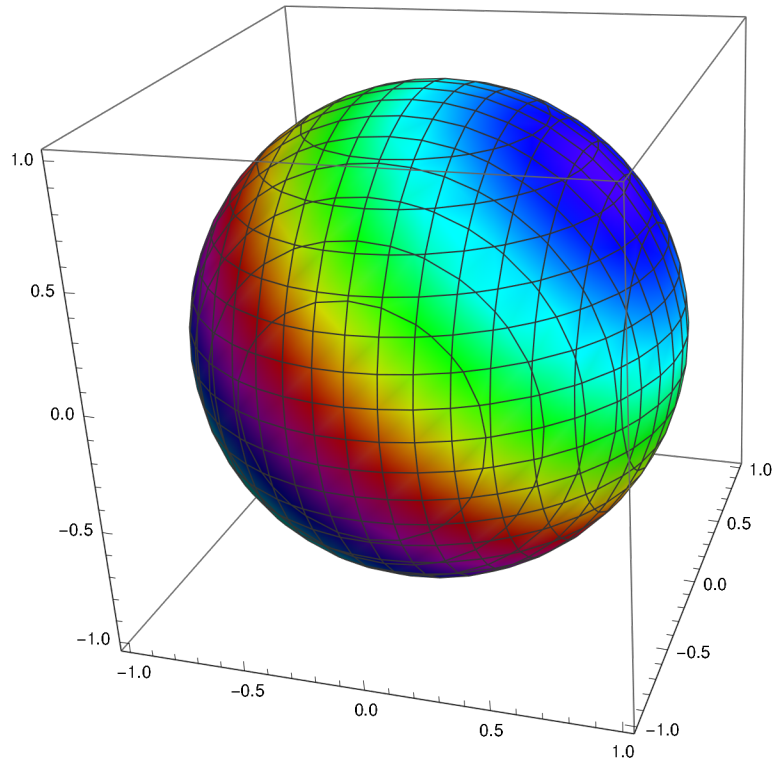


Out[18]=



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]]]
```

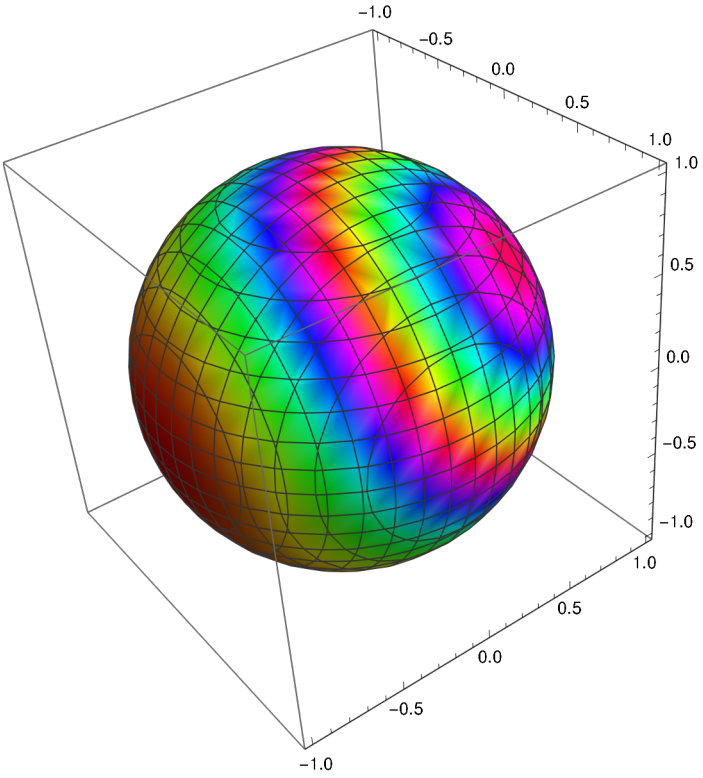
Out[ ]=




```
(*Ukazka 2*)
```

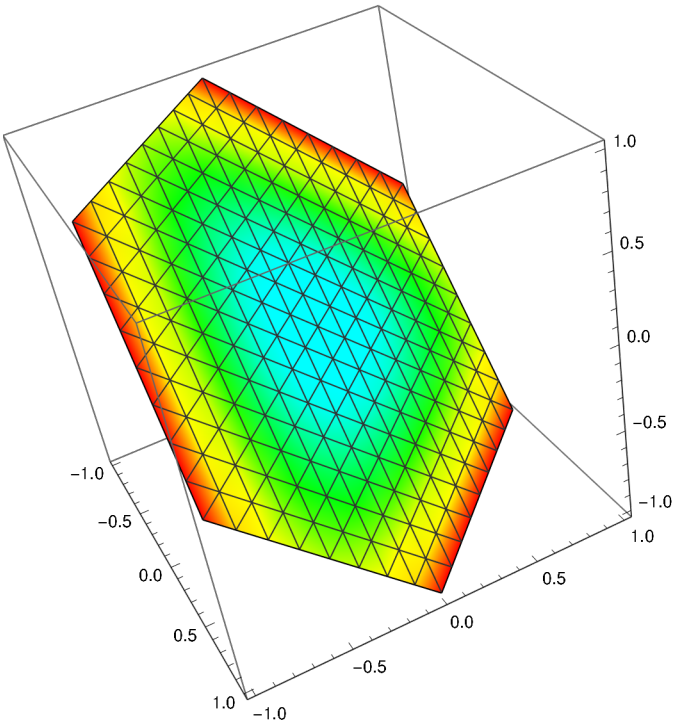
In[27]:=
```
ContourPlot3D[x^2 + y^2 + z^2 == 1, {x, -1, 1}, {y, -1, 1}, {z, -1, 1},
 BoxRatios → Automatic, ColorFunction → Function[{x, y, z}, Hue[x * y * z * 4]]]
```

Out[27]=



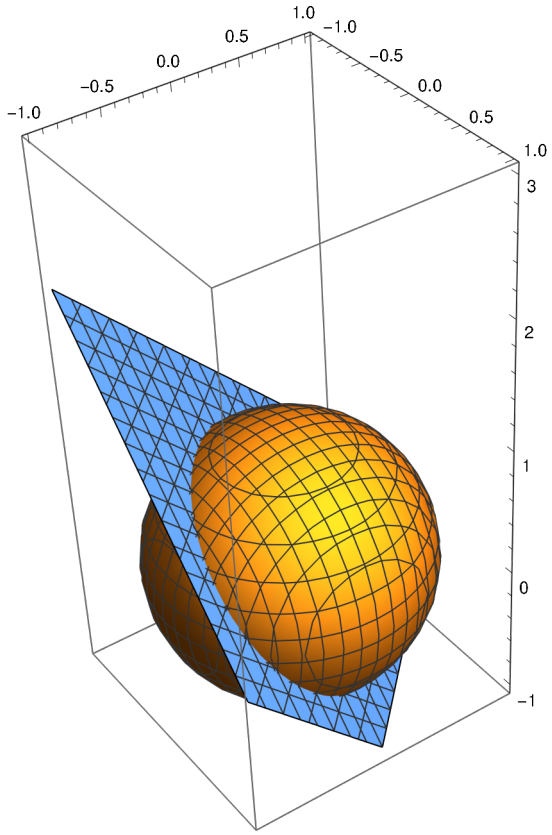
In[26]:=
```
ContourPlot3D[x + y + z == 0, {x, -1, 1}, {y, -1, 1}, {z, -1, 1},
 BoxRatios → Automatic, ColorFunction → Function[{x, y, z}, Hue[x * y * z * 4]]]
```

Out[26]=



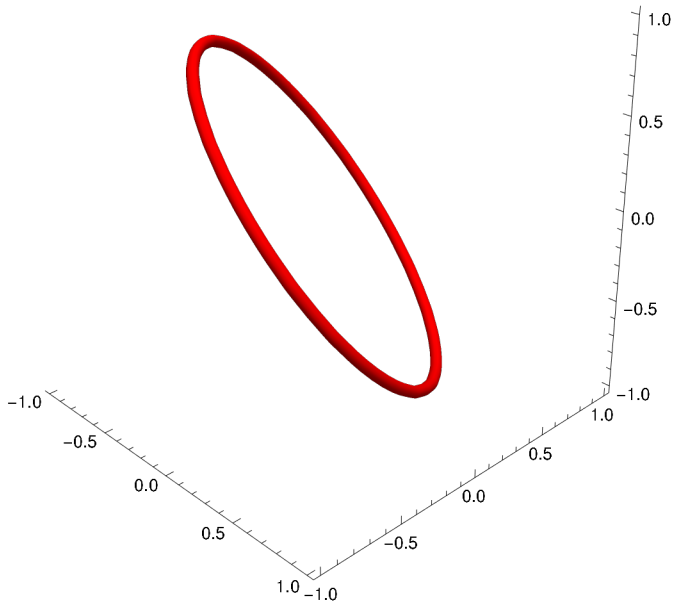
In[28]:=
```
ContourPlot3D [{x ^ 2 + y ^ 2 + z ^ 2 == 1, x + y + z == 0},
 {x, -1, 1}, {y, -1, 1}, {z, -1, 3}, BoxRatios → Automatic]
```

Out[28]=



In[32]:=
```
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]
```

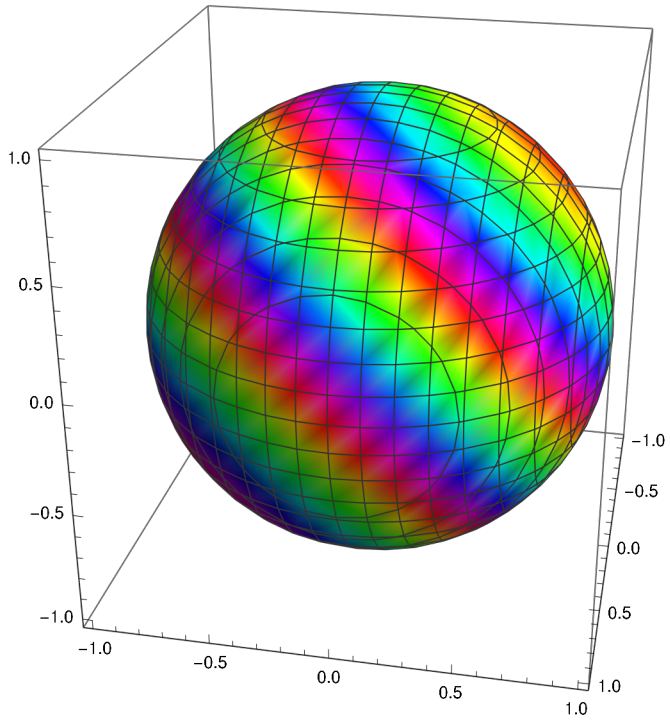
Out[32]=



(1 a)

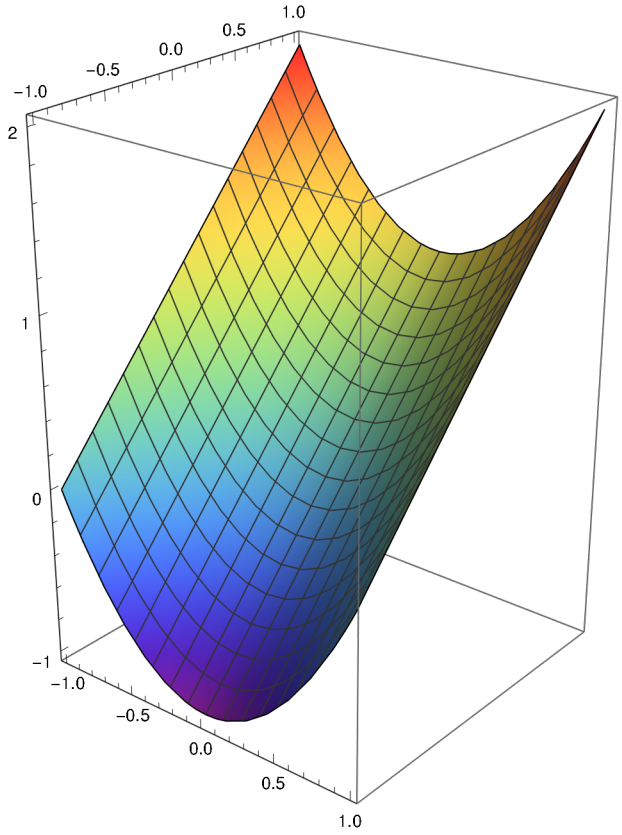
```
ContourPlot3D[x^2 + y^2 + z^2 == 1, {x, -1, 1}, {y, -1, 1}, {z, -1, 1},
 BoxRatios → Automatic, ColorFunction → Function[{x, y, z}, Hue[x * y * z]]]
```

Out[ ]=

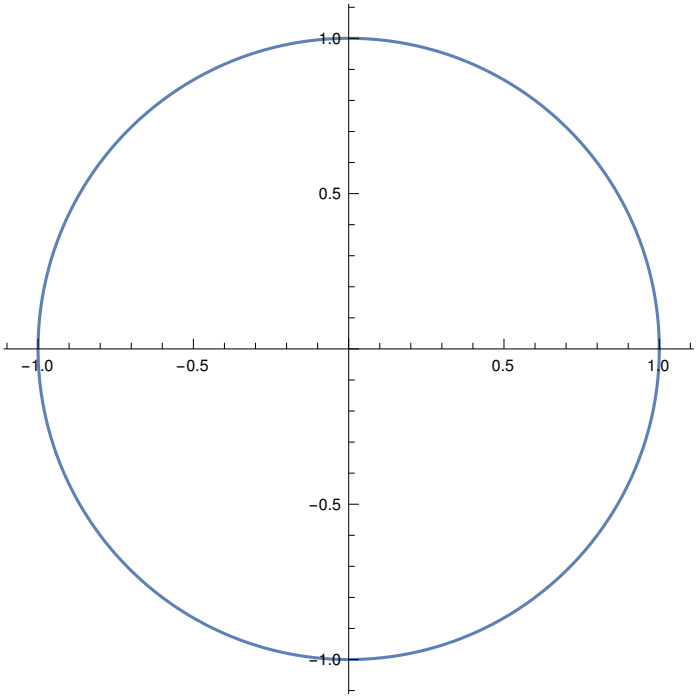


(b)

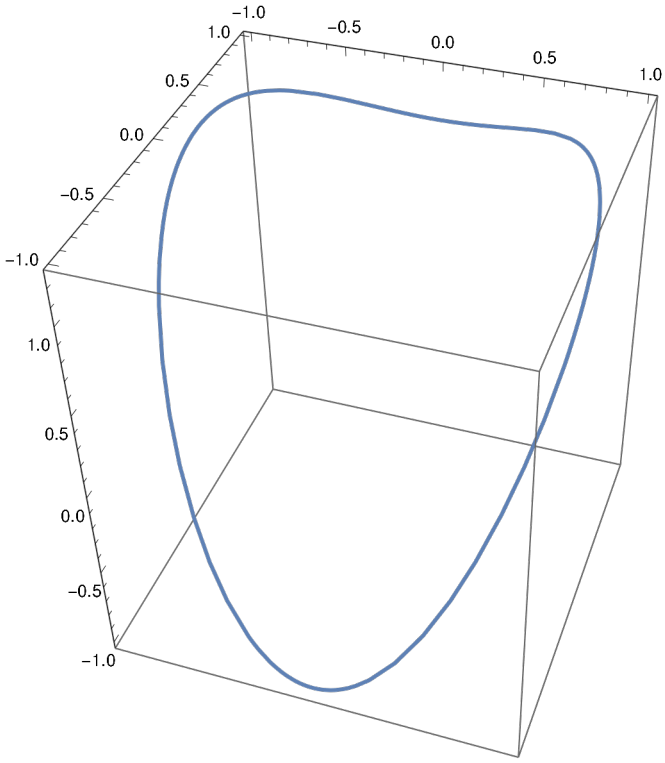
```
Plot3D[x^2 + y, {x, -1, 1}, {y, -1, 1}, BoxRatios → Automatic]
```




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

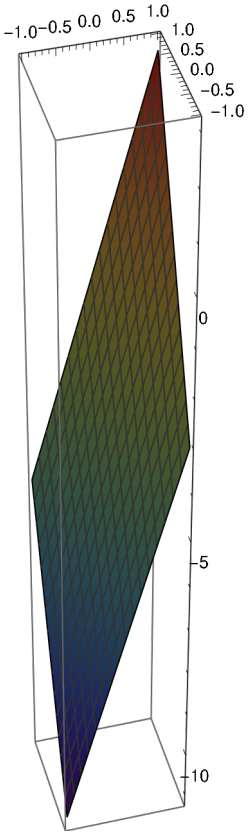


```
ParametricPlot3D [{Cos[u], Sin[u], (Cos[u])^2 + Sin[u]}, {u, 0, 2 Pi}, BoxRatios → Automatic]
```

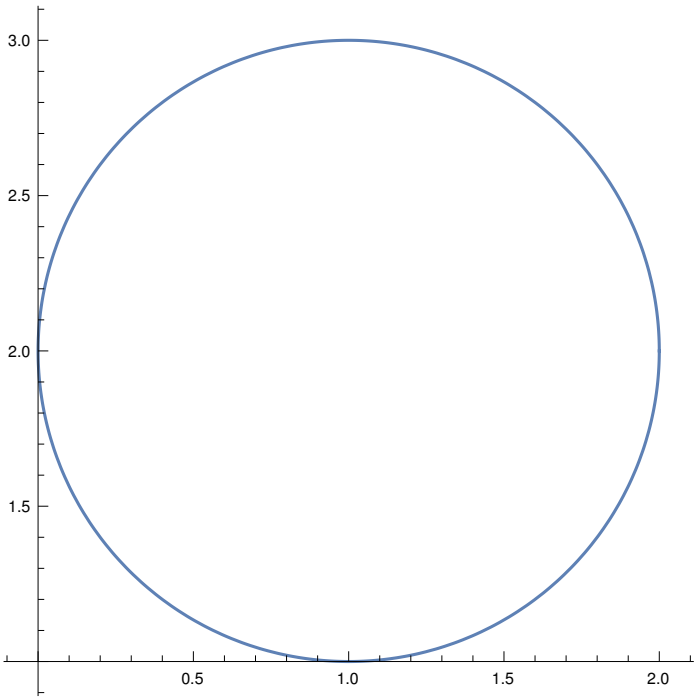


(c)

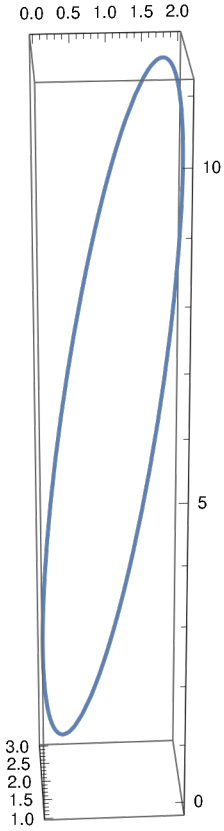
```
Plot3D[4 x + 3 y - 4, {x, -1, 1}, {y, -1, 1}, BoxRatios → Automatic]
```




```
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]
```

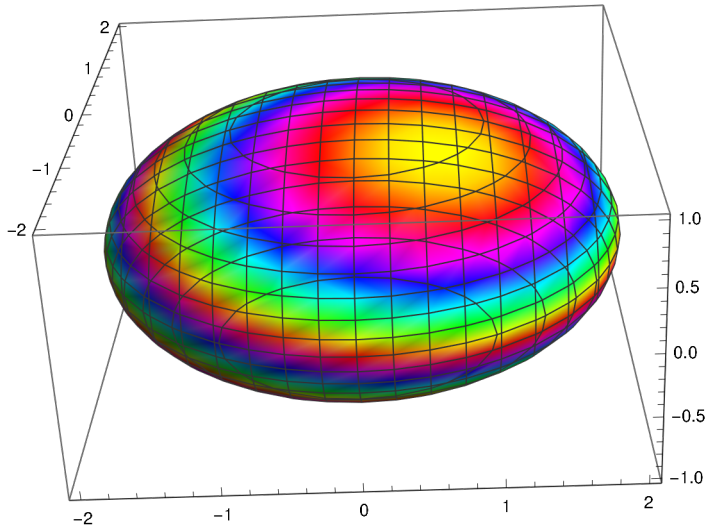


In[ ]:= **(d)**

```
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

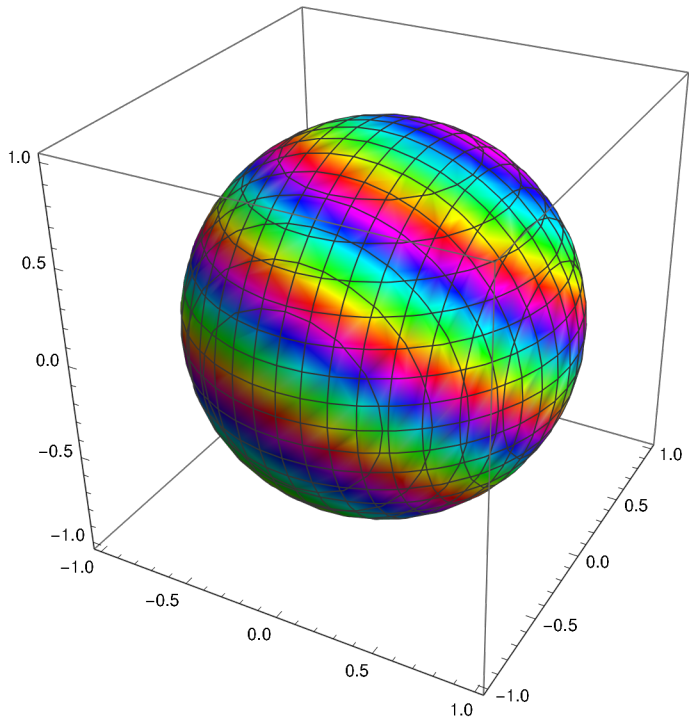
Out[ ]=



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

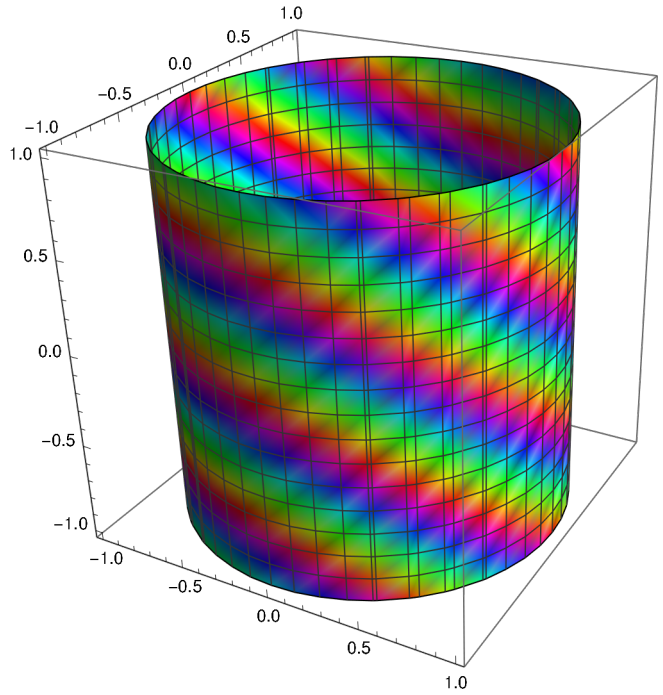
In[ ]:=
```
ContourPlot3D[x^2 + y^2 + z^2 == 0.9, {x, -1, 1}, {y, -1, 1}, {z, -1, 1},
 BoxRatios → Automatic, ColorFunction → Function[{x, y, z}, Hue[x + 2 y + 3 z]]]
```

Out[ ]=



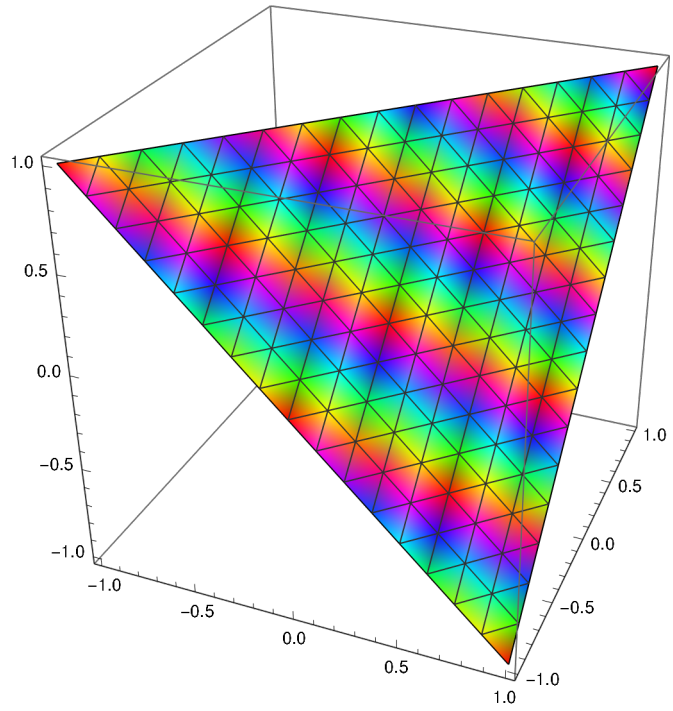
In[ ]:=
```
ContourPlot3D[x^2 + y^2 == 1, {x, -1, 1}, {y, -1, 1}, {z, -1, 1},
 BoxRatios → Automatic, ColorFunction → Function[{x, y, z}, Hue[x + 2 y + 3 z]]]
```

Out[ ]=



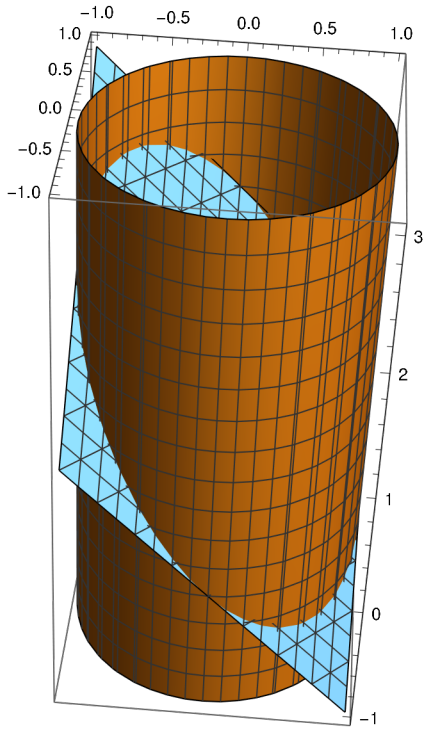
In[ ]:=
```
ContourPlot3D[x - y + z == 1, {x, -1, 1}, {y, -1, 1}, {z, -1, 1},
 BoxRatios → Automatic, ColorFunction → Function[{x, y, z}, Hue[x + 2 y + 3 z]]]
```

Out[ ]=



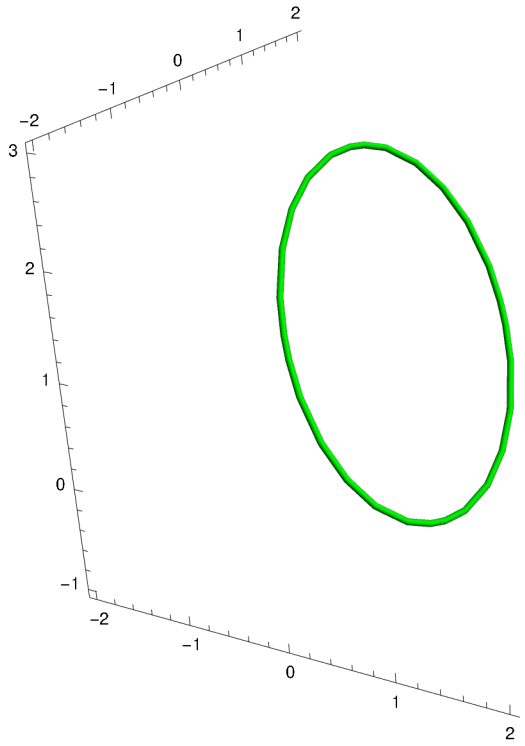
In[ ]:=
```
ContourPlot3D [{x ^ 2 + y ^ 2 == 1, x - y + z == 1},
  {x, -1, 1}, {y, -1, 1}, {z, -1, 3}, BoxRatios → Automatic]
```

Out[ ]=



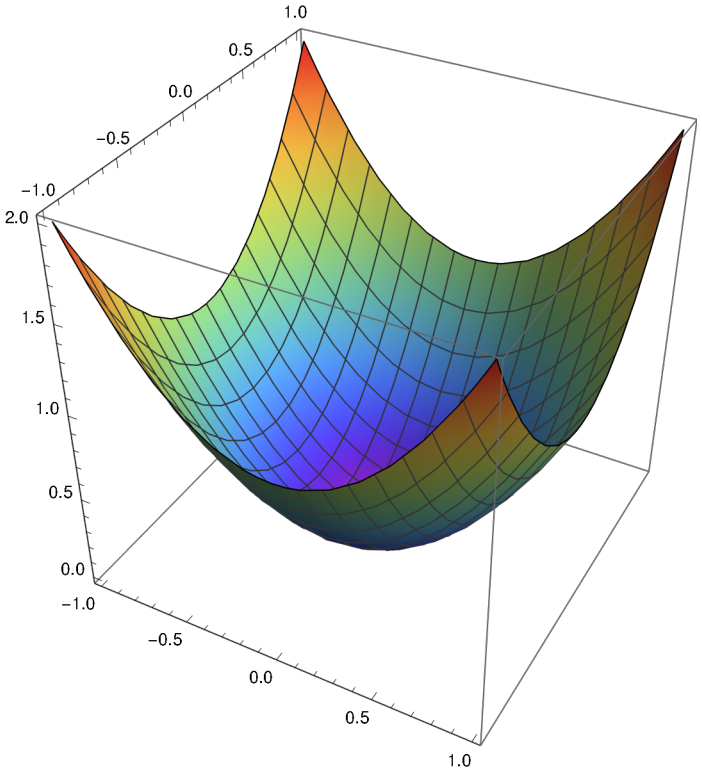
In[ ]:=
```
ContourPlot3D [{x ^ 2 + y ^ 2 == 1, x - y + z == 1}, {x, -2, 2},
 {y, -2, 2}, {z, -1, 3}, ContourStyle → Opacity[0], Mesh → None,
 BoundaryStyle → {1 → None, 2 → None, {1, 2} → {{Green, Tube[.03]}}}, Boxed → False]
```

Out[ ]=

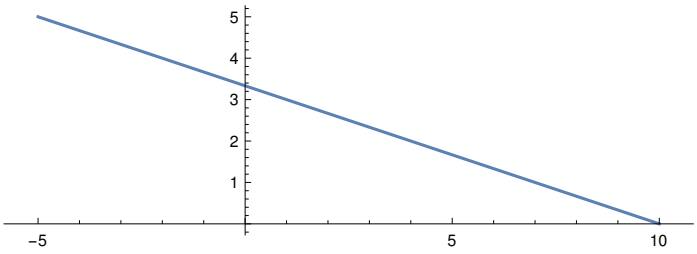


(f)

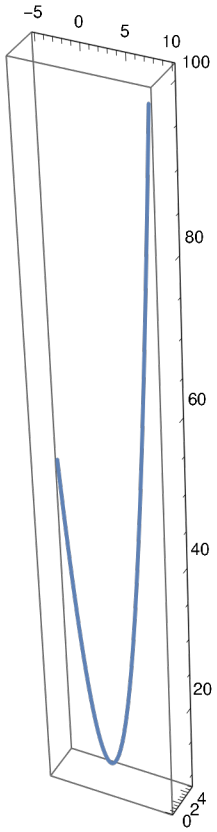
```
Plot3D[x^2 + y^2, {x, -1, 1}, {y, -1, 1}, BoxRatios → Automatic]
```




```
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]
```

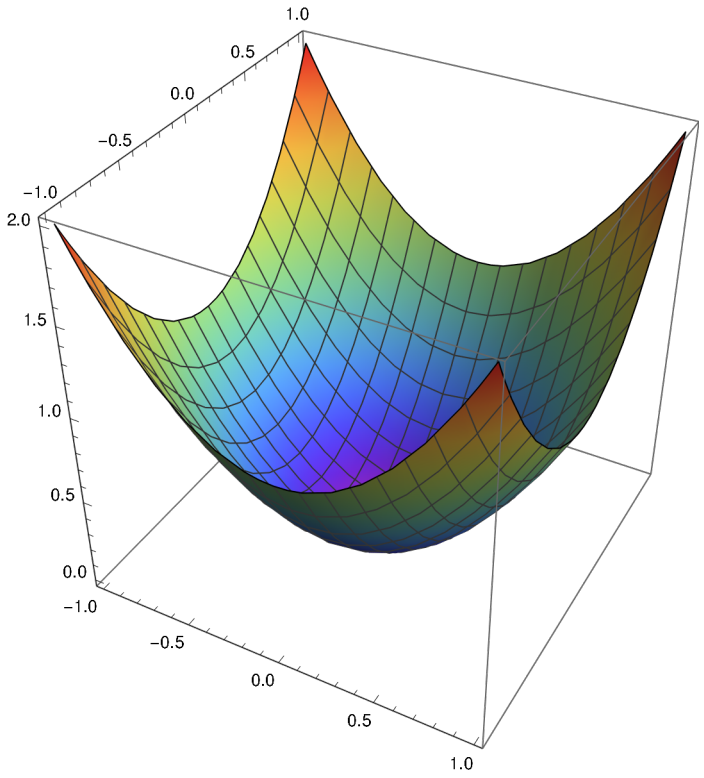


In[ ]:= **(g)**

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

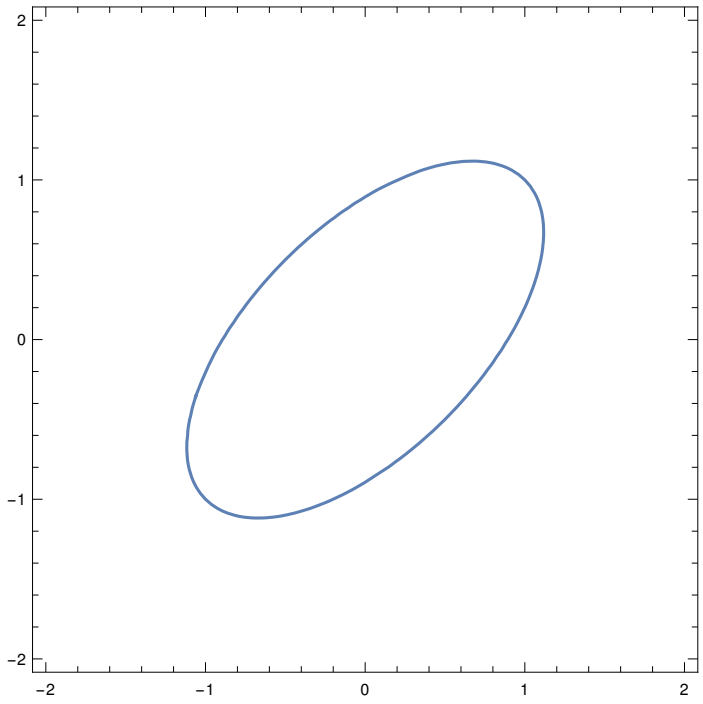
Out[ ]= g

Out[ ]=



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

Out[ ]=



In[ ]:=
```
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]
```

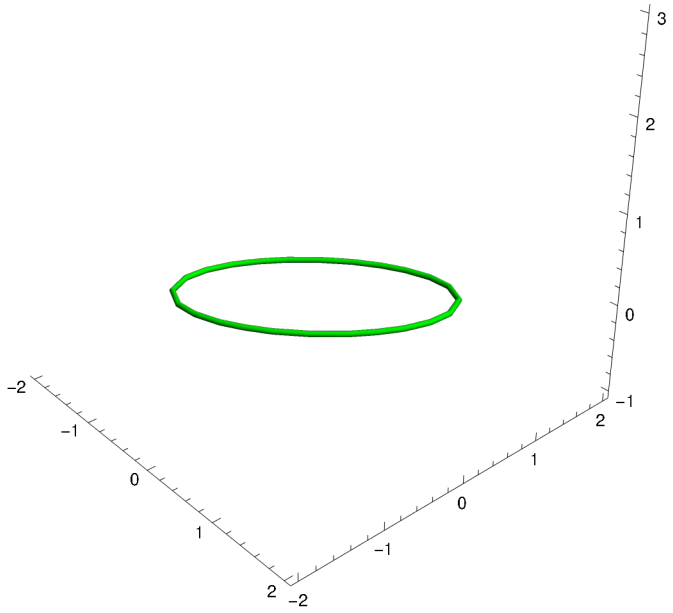
••• Set : Tag Plus in 1. + 1. is Protected .

••• Set : Tag Plus in 1. + 1. is Protected .

••• Set : Tag Plus in 3.99886 + 3.99886 is Protected .

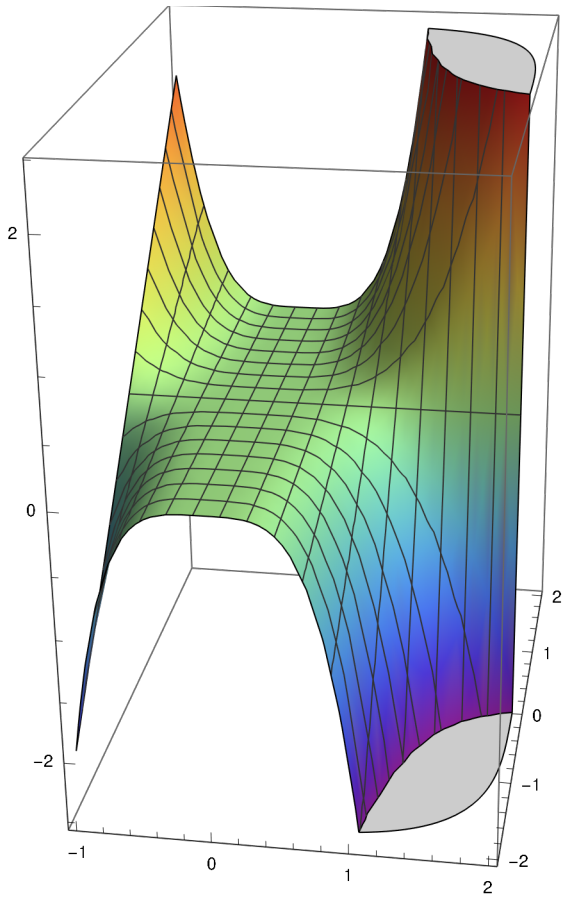
••• General : Further output of Set::write will be suppressed during this calculation .

Out[ ]=

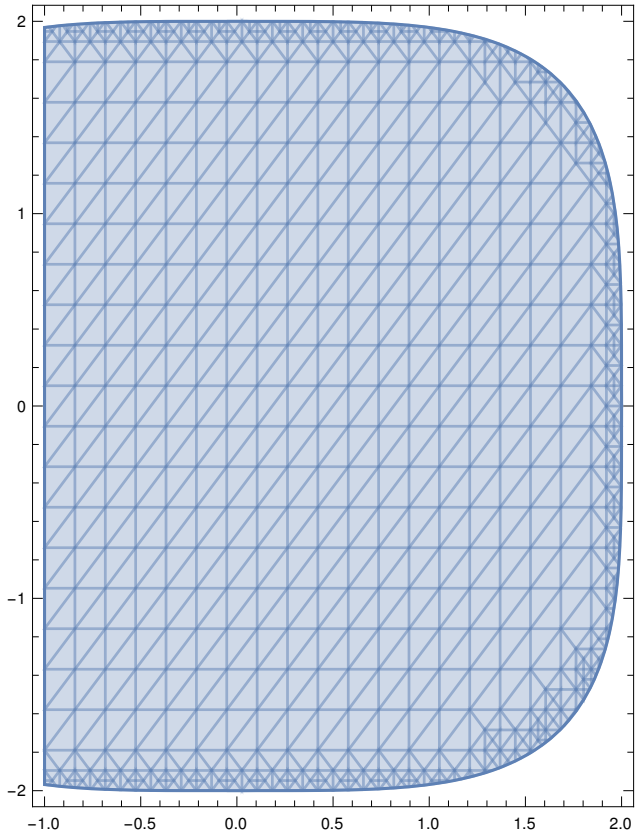


(2 a)

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

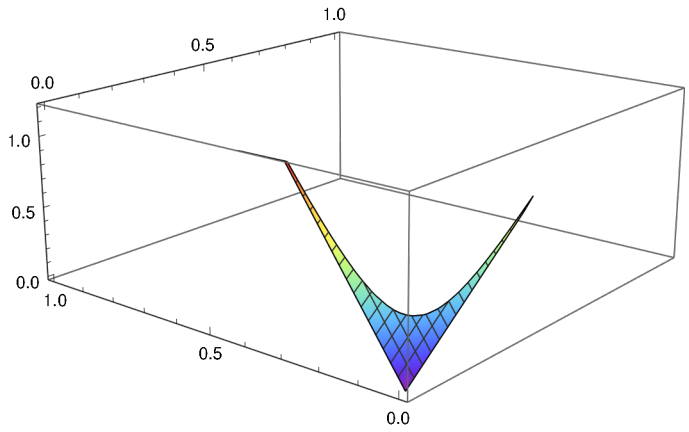


```
RegionPlot[x^4 + y^4 ≤ 16, {x, -1, 2}, {y, -2, 2}, AspectRatio → Automatic]
```

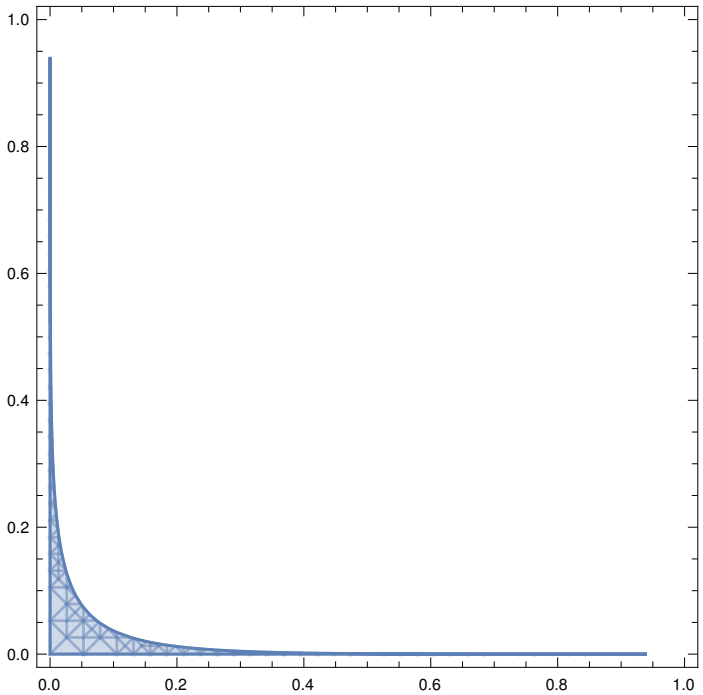


(b)

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

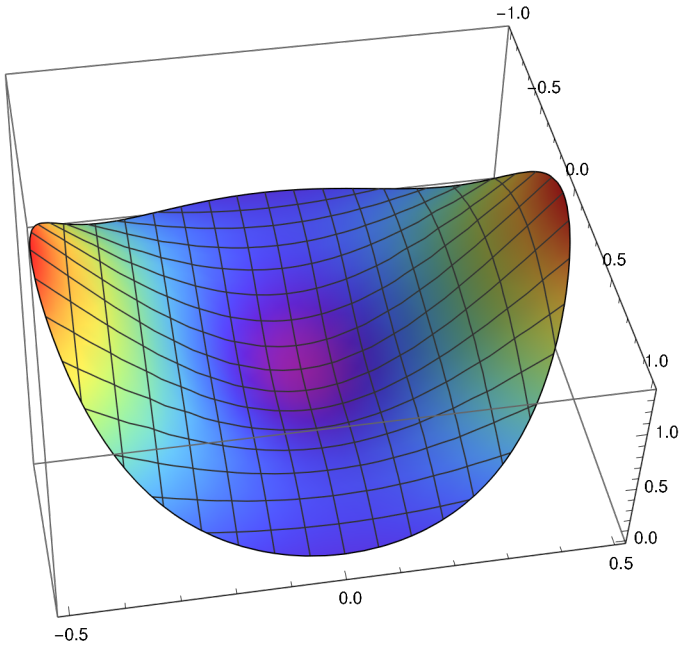



```
RegionPlot[x^(1 / 4) + y^(1 / 4) ≤ 1, {x, 0, 1}, {y, 0, 1}, AspectRatio → Automatic]
```



(e)

```
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]
```