In[18]:=
```
SetOptions[Plot3D(*Or whichever plot you desire*),
  ColorFunction → "Rainbow"(*One of many options*)];
```

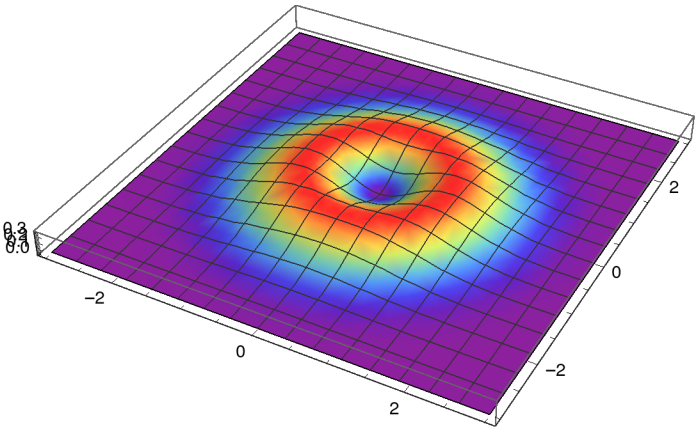
In[23]:=

(1 a)

```
Plot3D[(x^2 + y^2) Exp[-x^2 - y^2], {x, -3, 3}, {y, -3, 3}, BoxRatios → Automatic]
```

Out[23]= a

Out[24]=



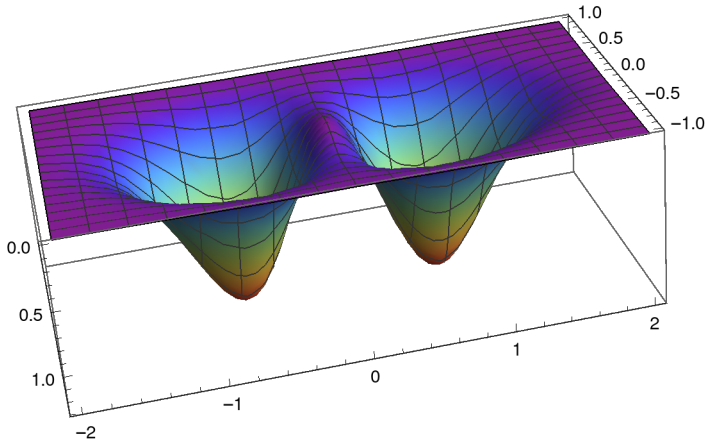
In[63]:=

(1 b)

```
Plot3D[(x^2 + 7 y^2) Exp[-5 x^2 - 2 y^2], {x, -1, 1}, {y, -2, 2}, BoxRatios → Automatic]
```

Out[63]= b

Out[64]=



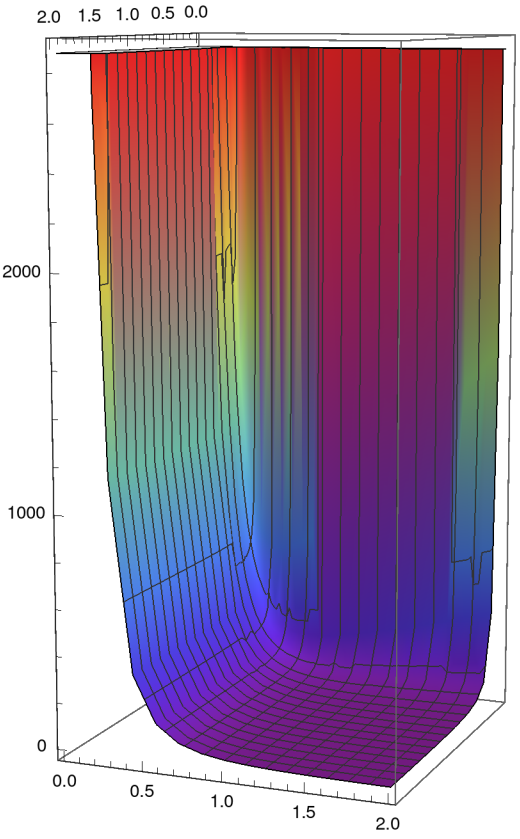
In[61]:=

(c)

```
Plot3D[3 x + 4 y / (x ^ 2) + 27 / (y ^ 3), {x, 0, 2}, {y, 0, 2}, BoxRatios → {1, 1, 2}]
```

Out[61]= C

Out[62]=

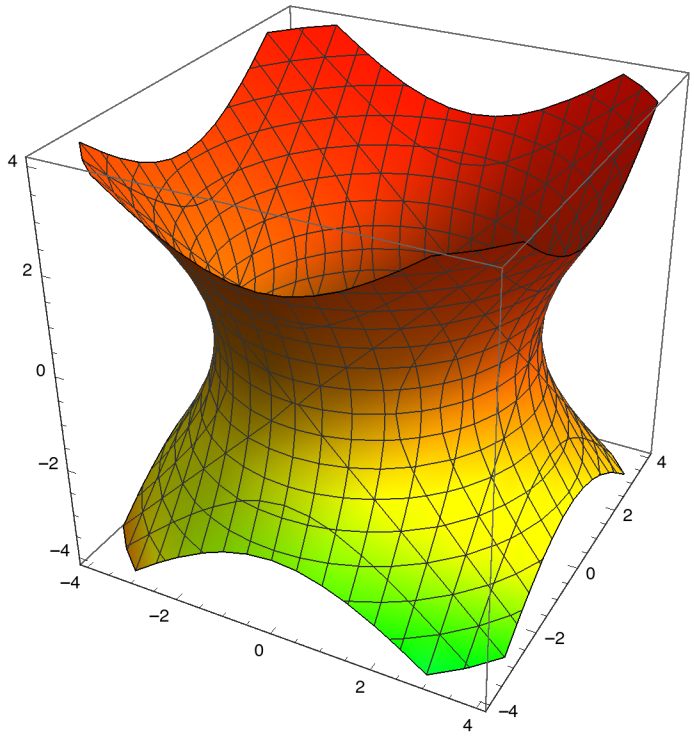


In[93]:= **(d)**

```
ContourPlot3D[{x^2 + y^2 - z^2 == 9}, {x, -4, 4}, {y, -4, 4}, {z, -4, 4},
 BoxRatios → Automatic, ColorFunction → Function[{x, y, z}, Hue[(x + y + z) Exp[-x - 2 y - 3 z]]]]
```

Out[93]= d

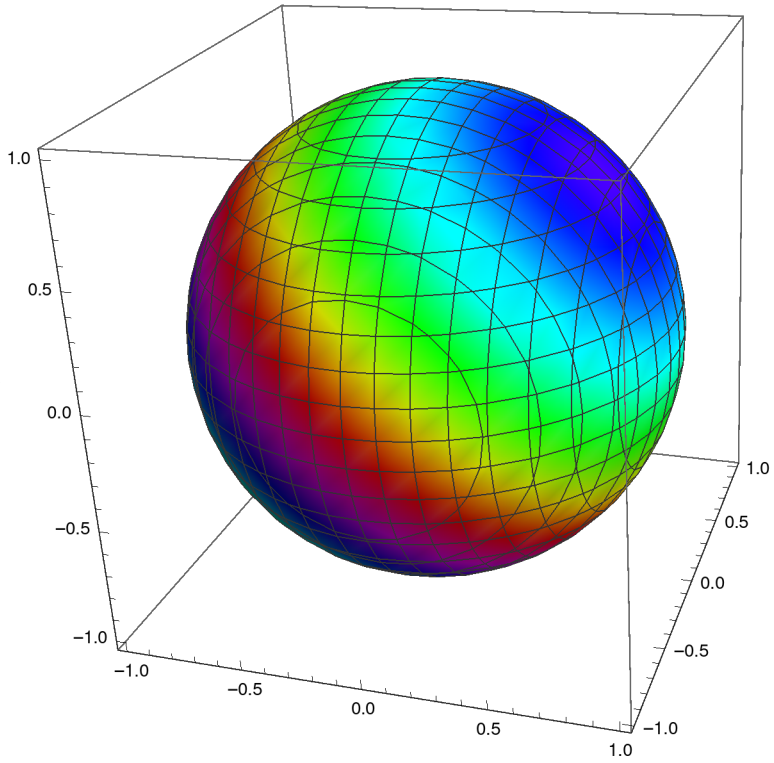
Out[94]=



(Ukazka)

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]]]
```

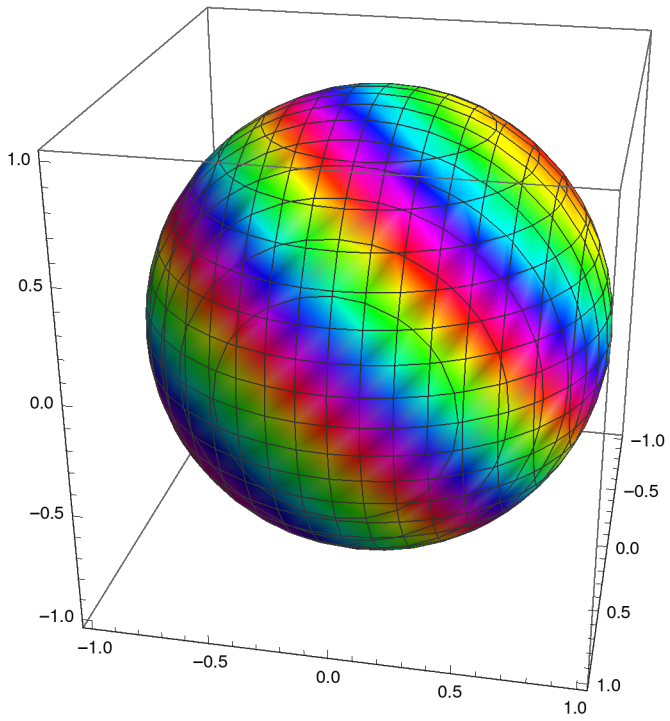
Out[ ]=



(2 a)

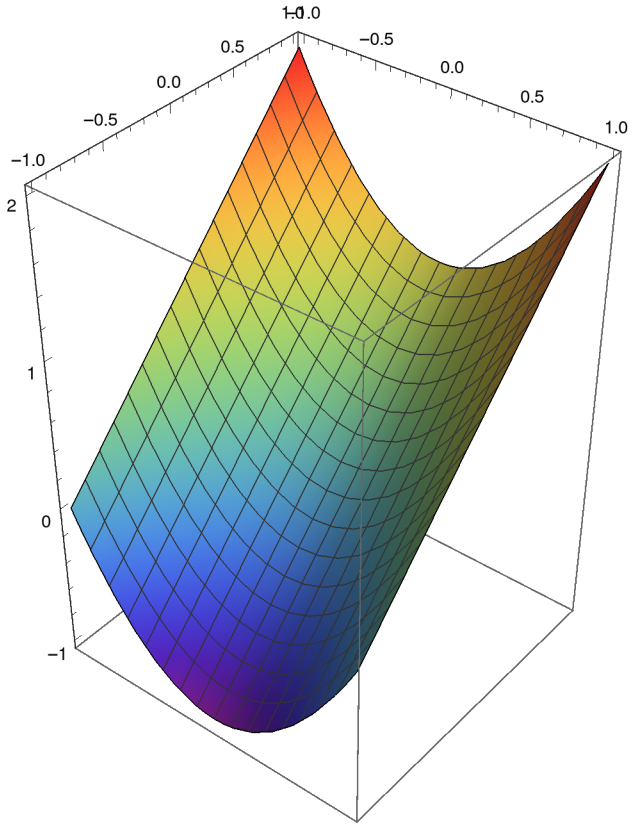
In[ ]:=
```
ContourPlot3D[x^2 + y^2 + z^2 == 1, {x, -1, 1}, {y, -1, 1}, {z, -1, 1},
  BoxRatios → Automatic, ColorFunction → Function[{x, y, z}, Hue[x - 2 y - 2 z]]]
```

Out[ ]=

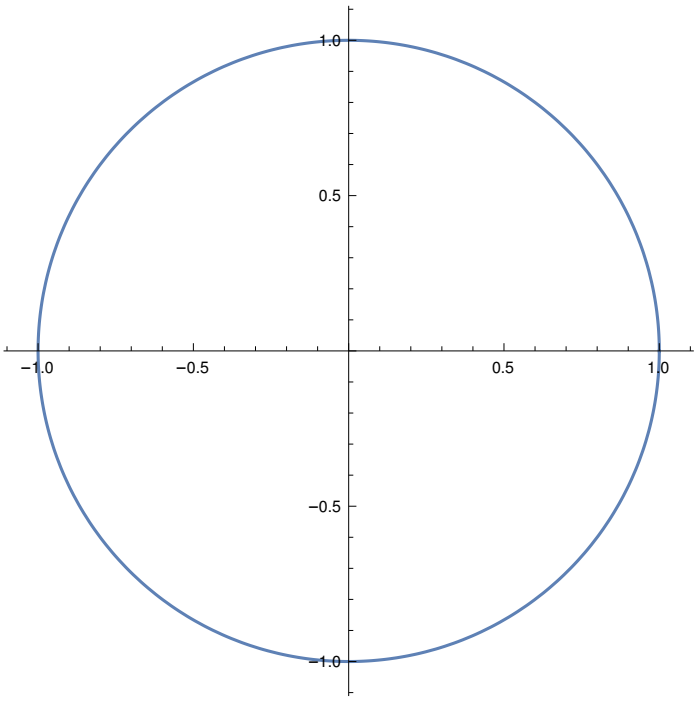


(2 b)

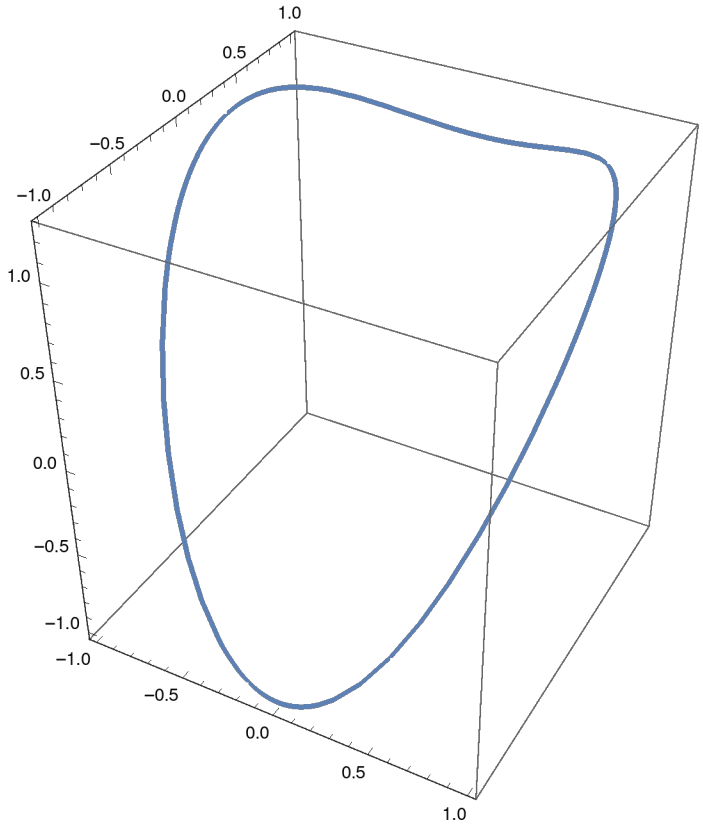
```
Plot3D[x^2 + y, {x, -1, 1}, {y, -1, 1}, BoxRatios → Automatic]
```




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

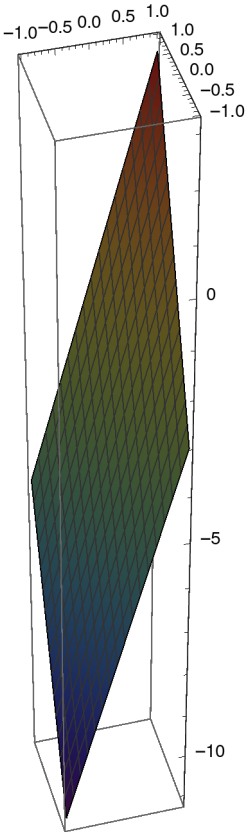


```
ParametricPlot3D[{Cos[u], Sin[u], (Cos[u])^2 + Sin[u]}, {u, 0, 2 Pi}, BoxRatios → Automatic]
```

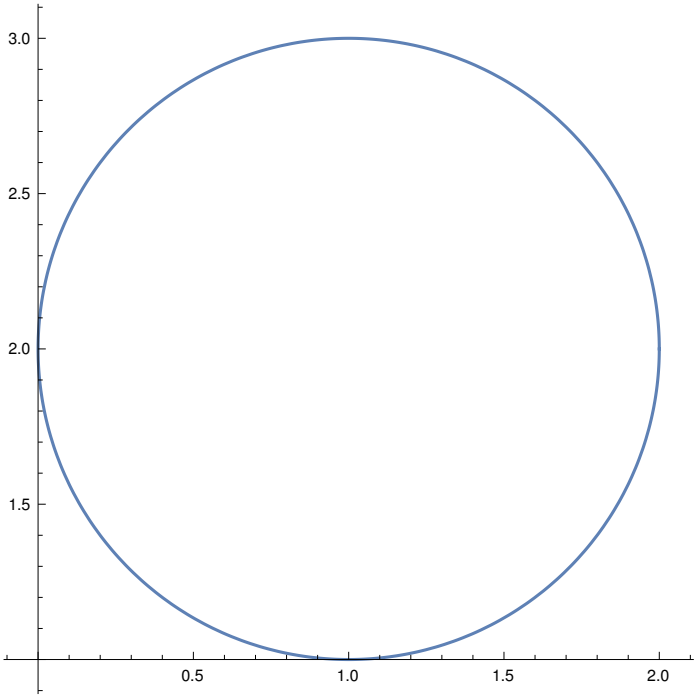


(c)

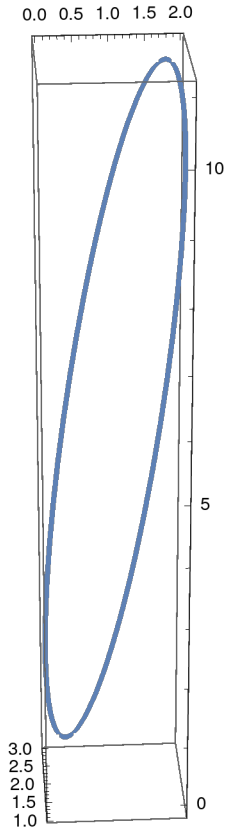
```
Plot3D[4 x + 3 y - 4, {x, -1, 1}, {y, -1, 1}, BoxRatios → Automatic]
```




```
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]
```

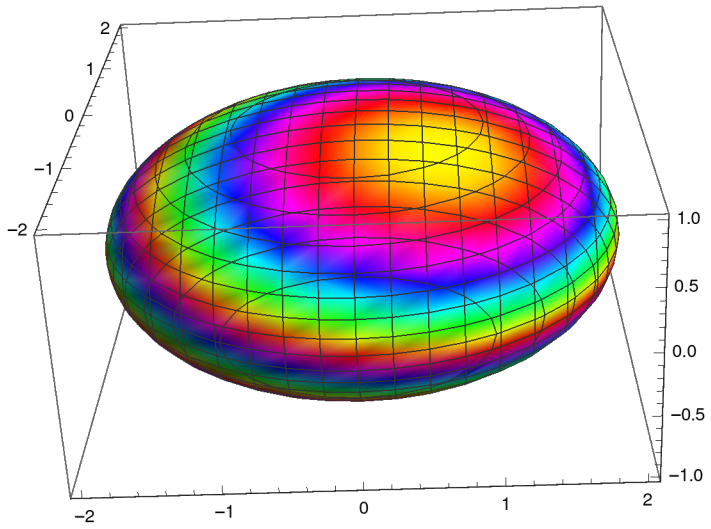


In[ ]:= **(d)**

```
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

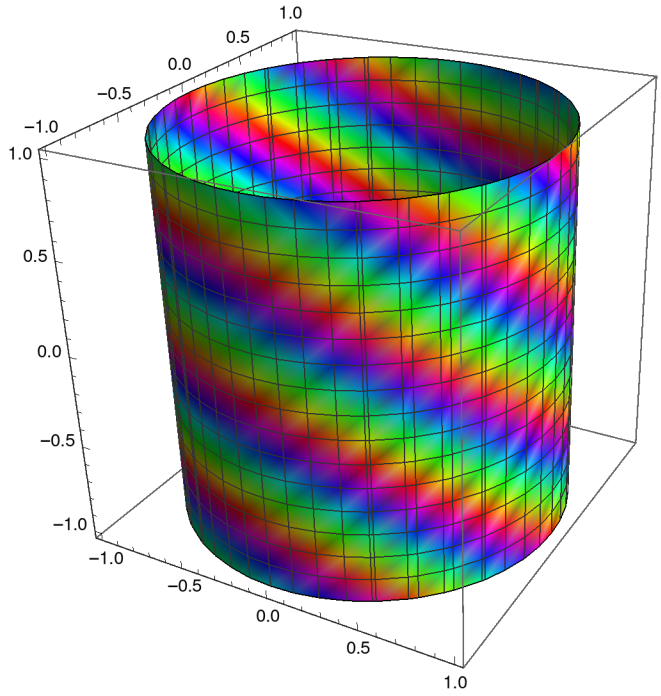
Out[ ]=



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

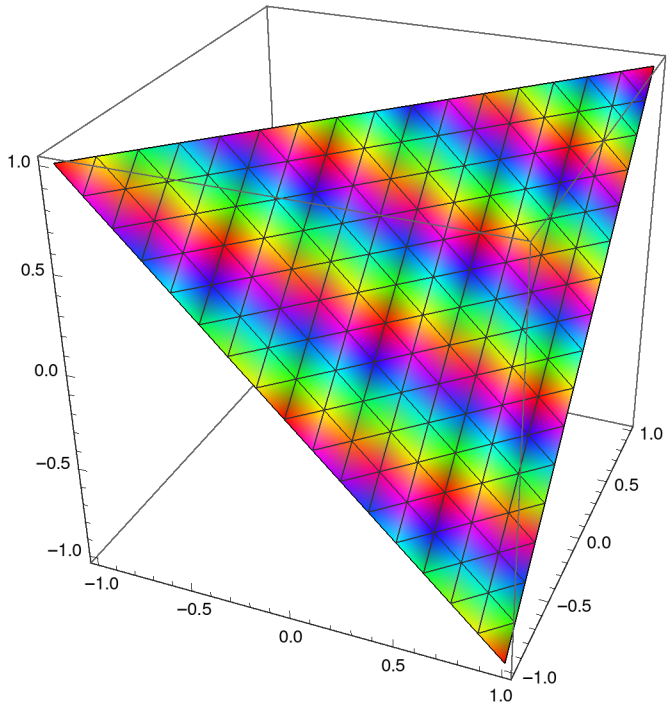
In[ ]:=
```
ContourPlot3D[x^2 + y^2 == 1, {x, -1, 1}, {y, -1, 1}, {z, -1, 1},
 BoxRatios → Automatic, ColorFunction → Function[{x, y, z}, Hue[x + 2 y + 3 z]]]
```

Out[ ]=



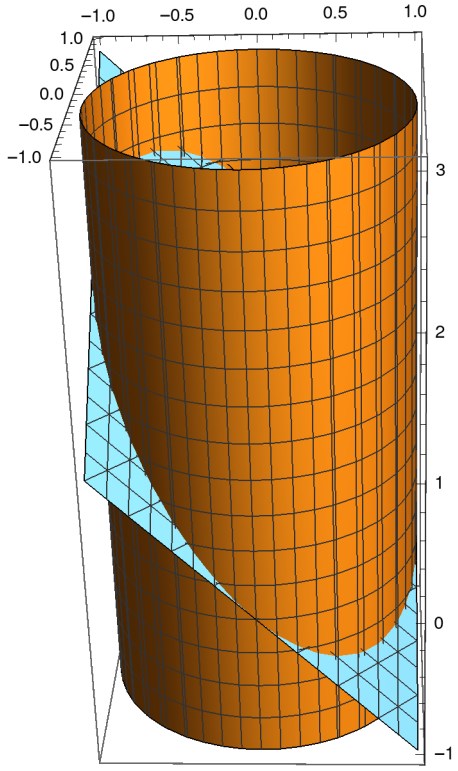
In[ ]:=
```
ContourPlot3D[x - y + z == 1, {x, -1, 1}, {y, -1, 1}, {z, -1, 1},
  BoxRatios → Automatic, ColorFunction → Function[{x, y, z}, Hue[x + 2 y + 3 z]]]
```

Out[ ]=



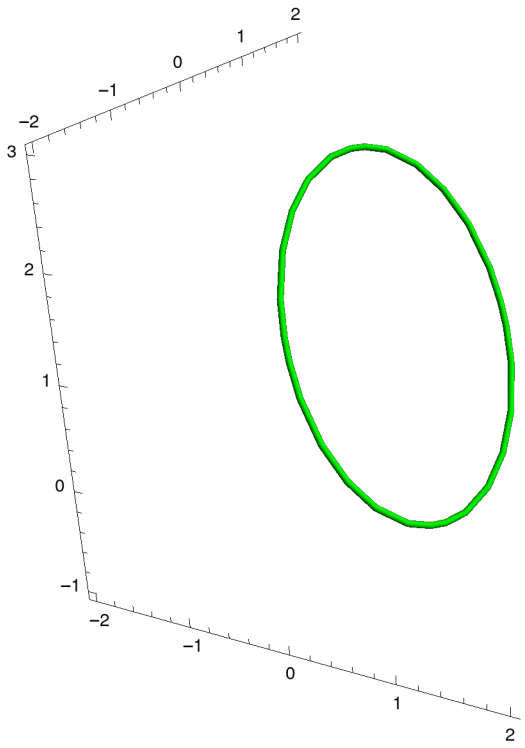
In[ ]:=
```
ContourPlot3D[{x^2 + y^2 == 1, x - y + z == 1},
  {x, -1, 1}, {y, -1, 1}, {z, -1, 3}, BoxRatios → Automatic]
```

Out[ ]=



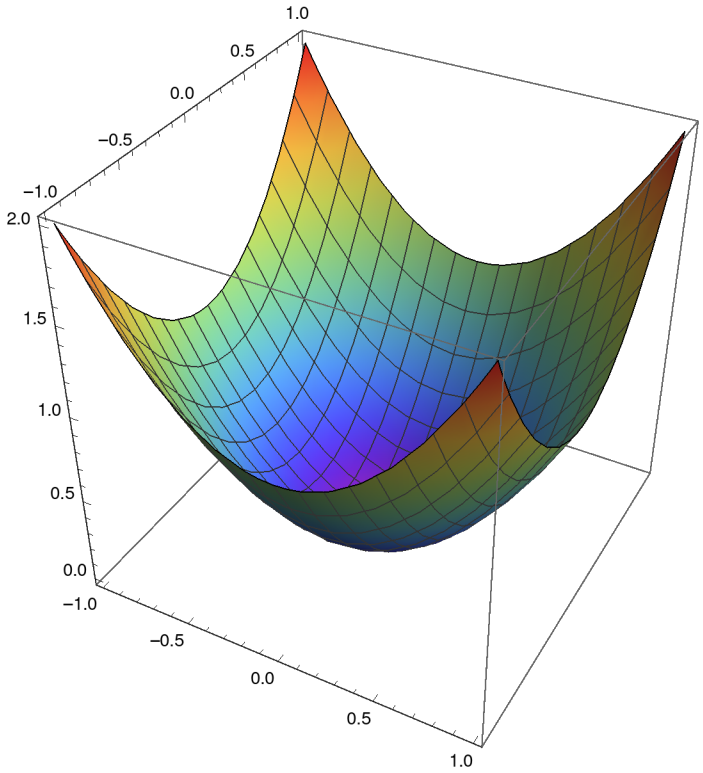
In[ ]:=
```
ContourPlot3D[{x^2 + y^2 == 1, x - y + z == 1}, {x, -2, 2},
 {y, -2, 2}, {z, -1, 3}, ContourStyle → Opacity[0], Mesh → None,
 BoundaryStyle → {1 → None, 2 → None, {1, 2} → {{Green, Tube[.03]}}}, Boxed → False]
```

Out[ ]=

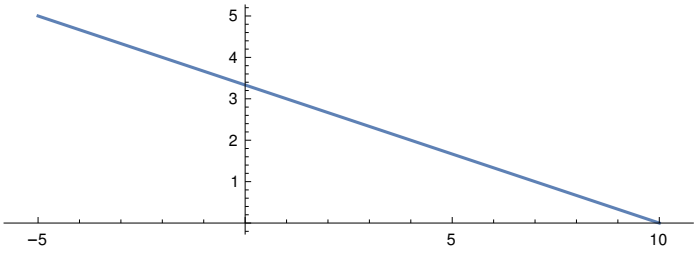


(f)

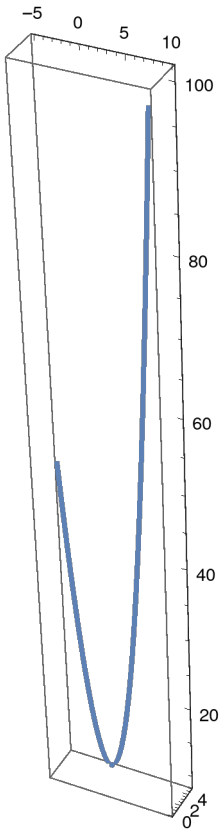
```
Plot3D[x^2 + y^2, {x, -1, 1}, {y, -1, 1}, BoxRatios → Automatic]
```




```
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]
```

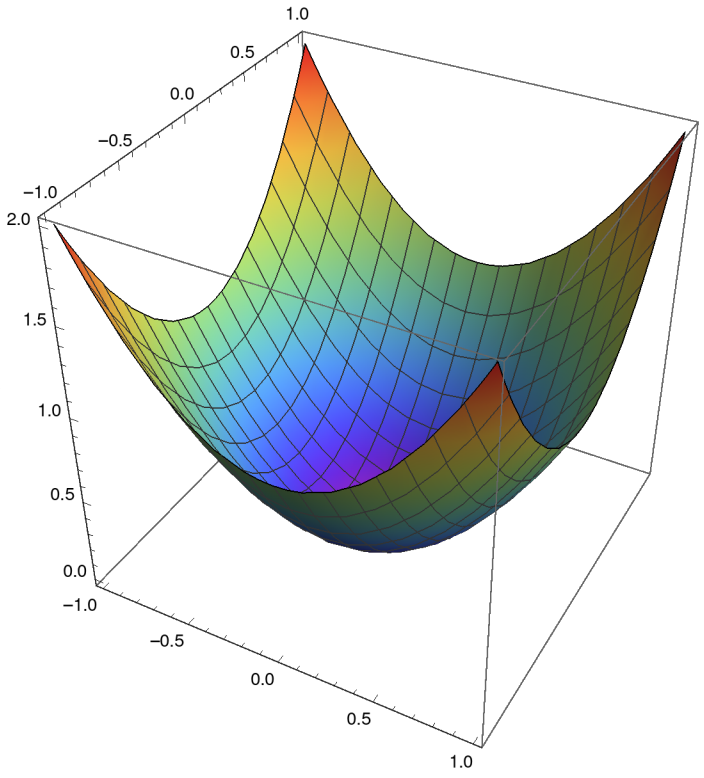


In[ ]:= **(g)**

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

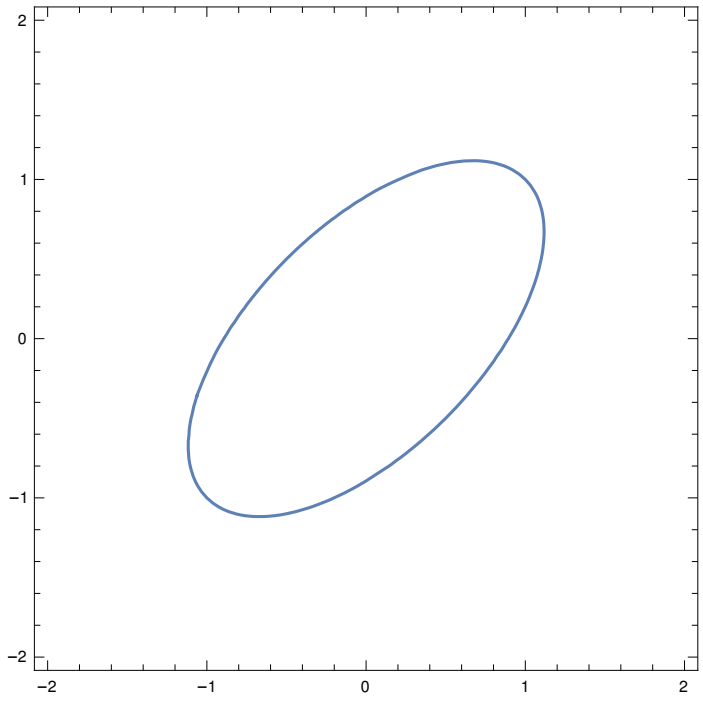
Out[ ]= g

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]
```

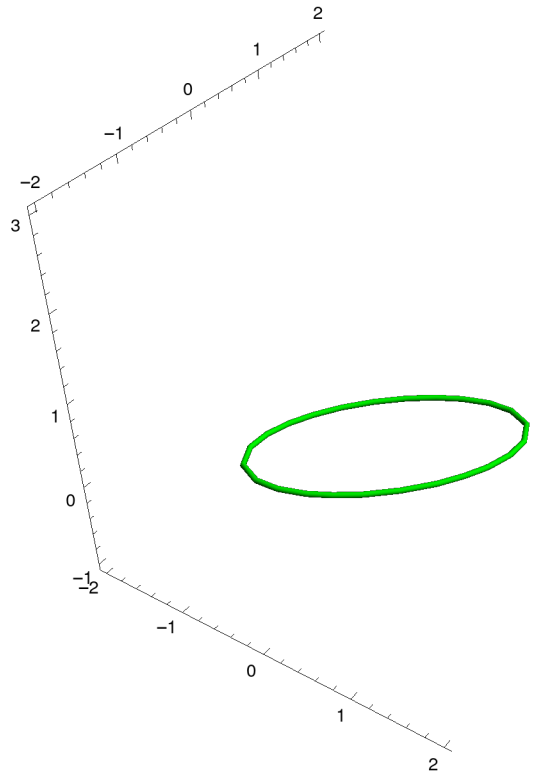
Set: Tag Plus in 1. + 1. is Protected.

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

Set: Tag Plus in 3.99886 + 3.99886 is Protected.

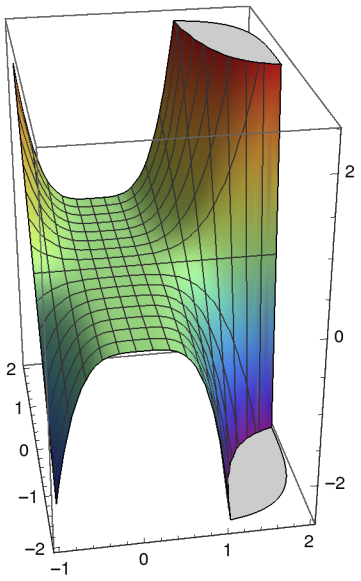
General: Further output of Set::write will be suppressed during this calculation.

Out[ ]=

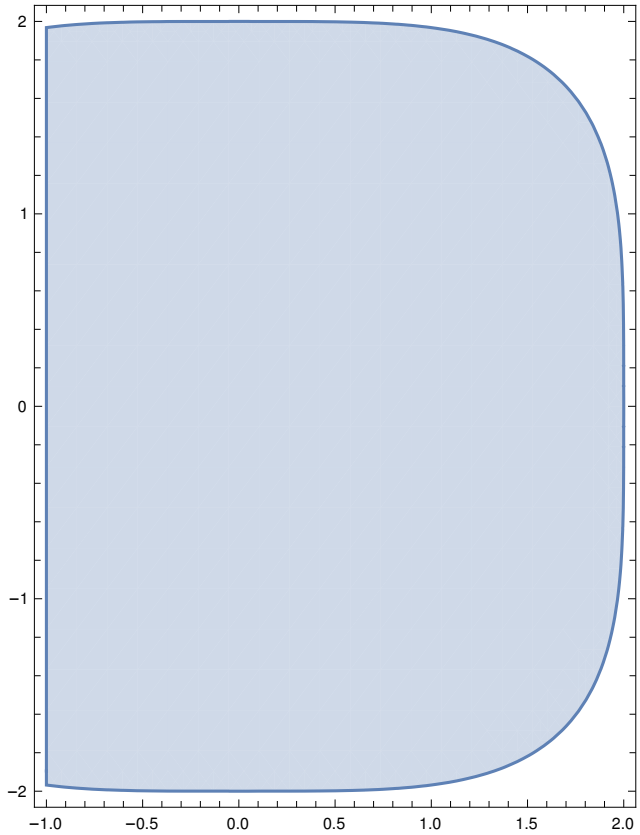


(4 a)

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

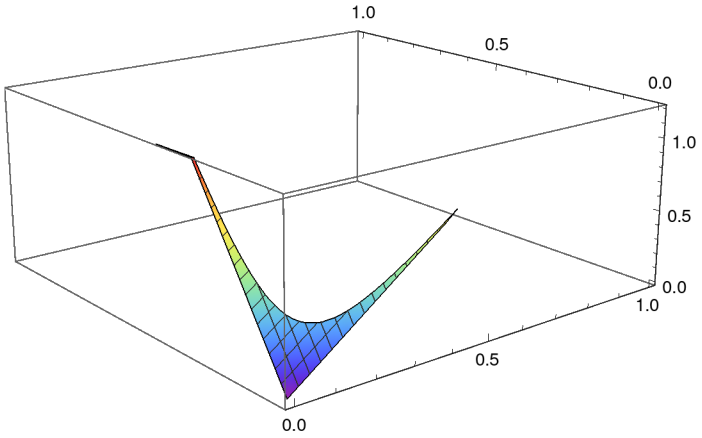



```
RegionPlot[x^4 + y^4 ≤ 16, {x, -1, 2}, {y, -2, 2}, AspectRatio → Automatic]
```

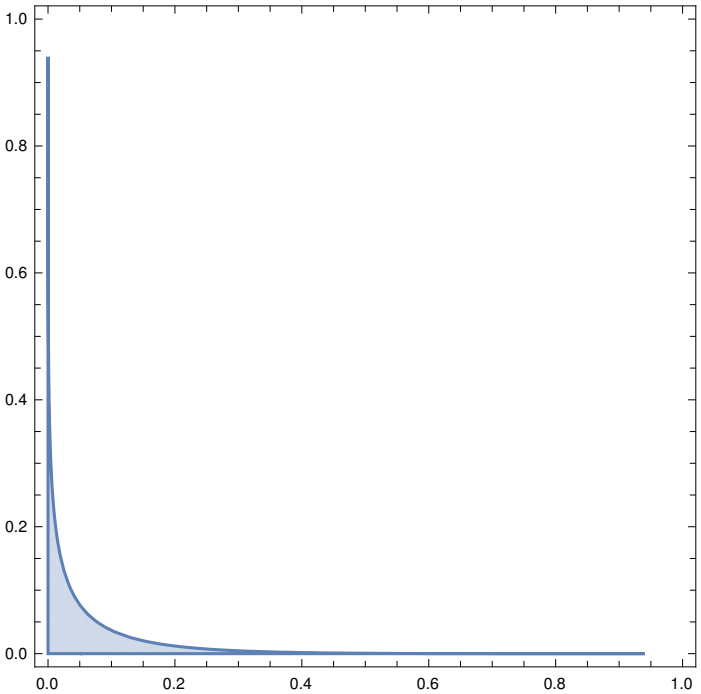


(b)

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

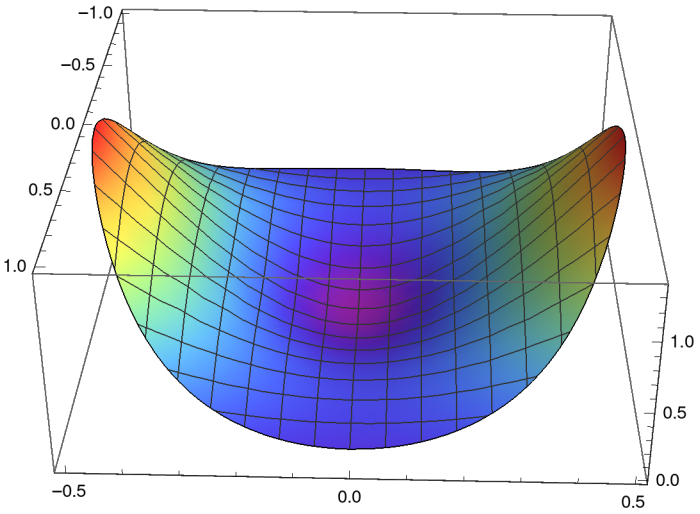



```
RegionPlot[x^(1 / 4) + y^(1 / 4) ≤ 1, {x, 0, 1}, {y, 0, 1}, AspectRatio → Automatic]
```



(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]
```