

```

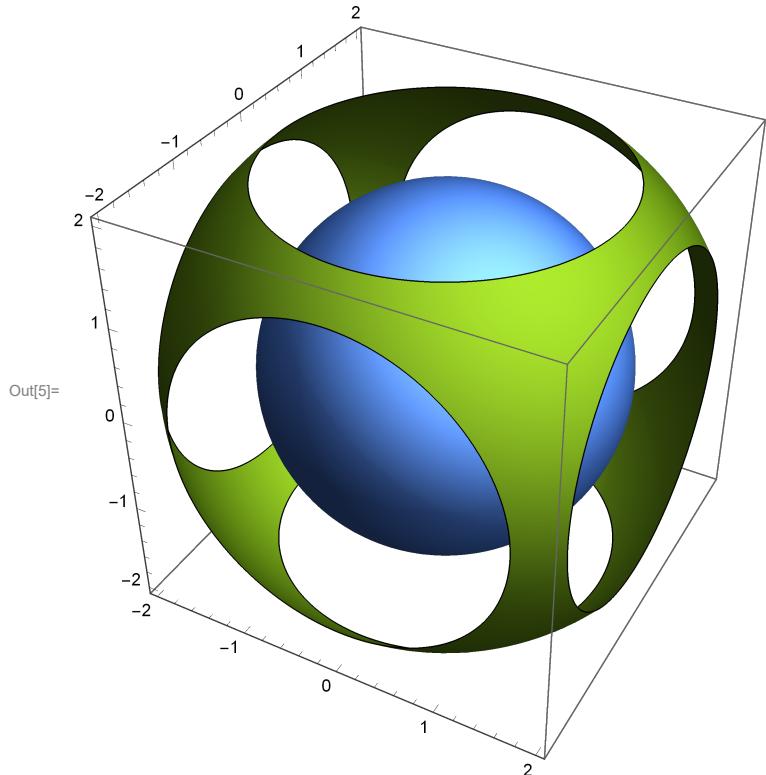
In[1]:= f[x_, y_, z_] := Sqrt[x^2 + y^2 + z^2];
a = D[f[x, y, z], x]
b = D[f[x, y, z], y]
c = D[f[x, y, z], z]
ContourPlot3D[f[x, y, z], {x, -2, 2}, {y, -2, 2}, {z, -2, 2}, Mesh -> None]
VectorPlot3D[{a, b, c}, {x, -2, 2}, {y, -2, 2}, {z, -2, 2},
  VectorColorFunction -> Function[{x, y, z, u, v, w, norm}, ColorData["Rainbow"] [norm]],
  VectorColorFunctionScaling -> True]

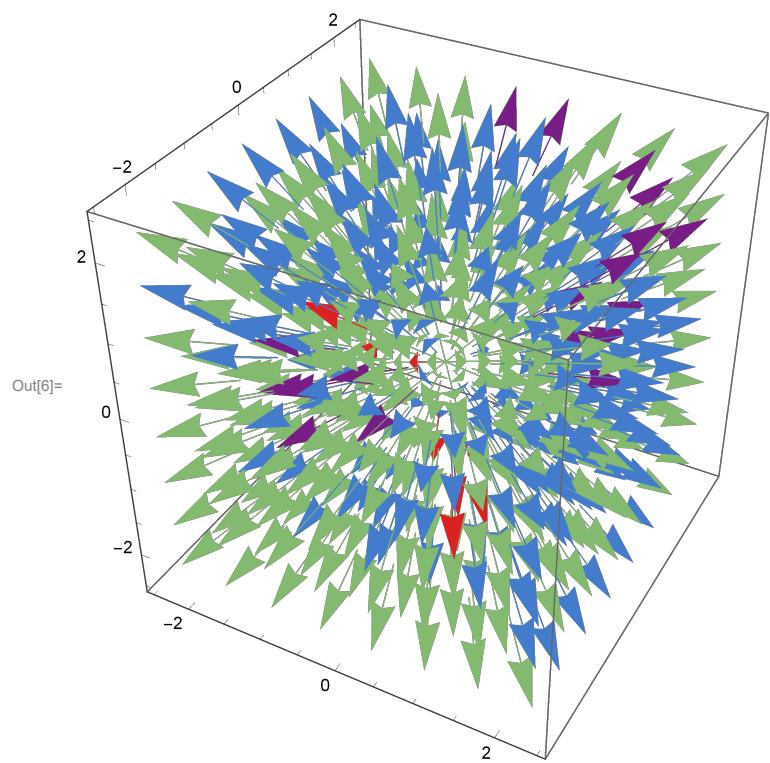
```

$$\text{Out}[2]= \frac{x}{\sqrt{x^2 + y^2 + z^2}}$$

$$\text{Out}[3]= \frac{y}{\sqrt{x^2 + y^2 + z^2}}$$

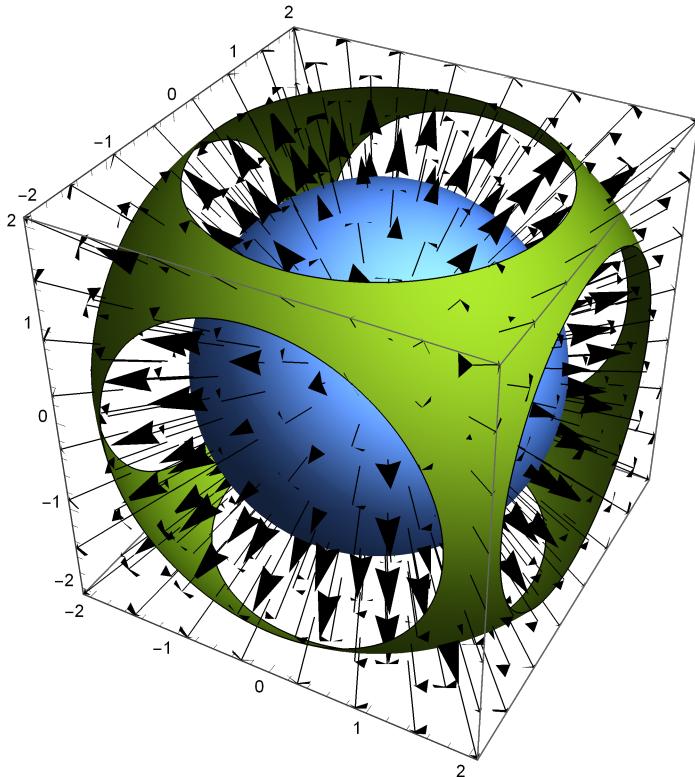
$$\text{Out}[4]= \frac{z}{\sqrt{x^2 + y^2 + z^2}}$$





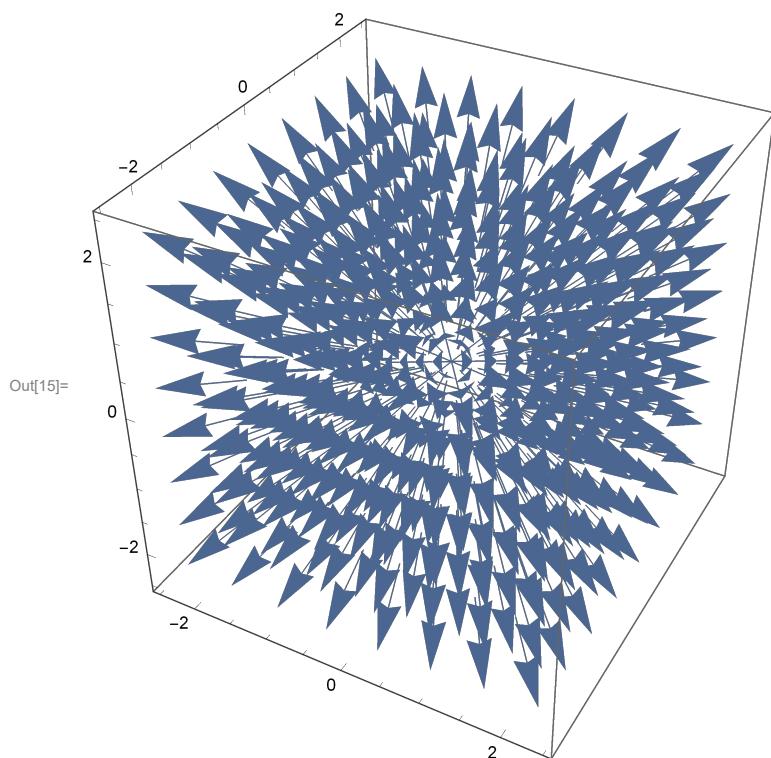
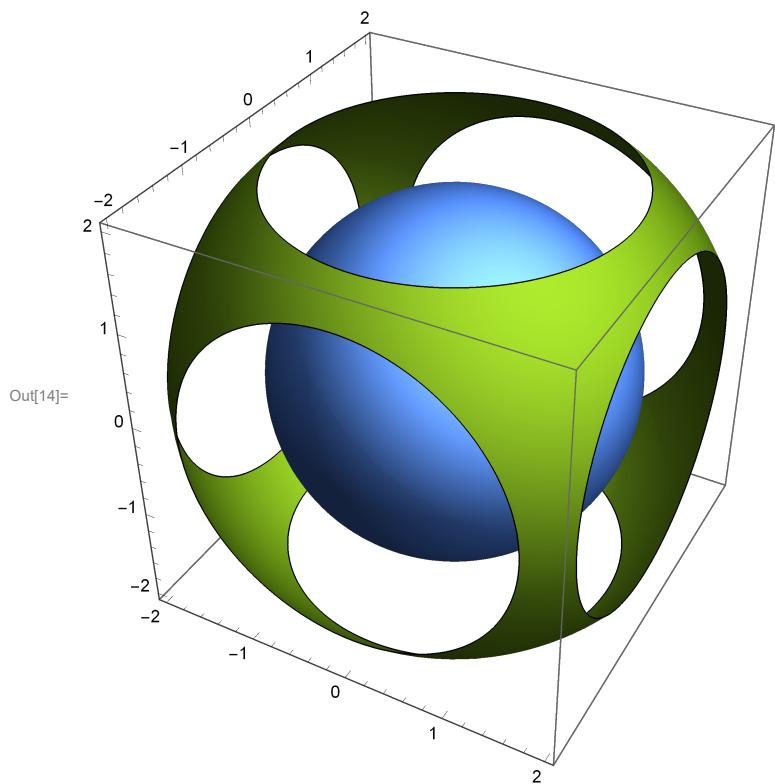
```
In[7]:= f[x_, y_, z_] := Sqrt[x^2 + y^2 + z^2];
grad = Grad[f[x, y, z], {x, y, z}]
plot1 = ContourPlot3D[f[x, y, z], {x, -2, 2}, {y, -2, 2}, {z, -2, 2}, Mesh -> None];
plot2 = VectorPlot3D[grad, {x, -2, 2}, {y, -2, 2}, {z, -2, 2}, VectorStyle -> Black];
Show[plot1, plot2]
```

$$\text{Out}[8]= \left\{ \frac{x}{\sqrt{x^2 + y^2 + z^2}}, \frac{y}{\sqrt{x^2 + y^2 + z^2}}, \frac{z}{\sqrt{x^2 + y^2 + z^2}} \right\}$$



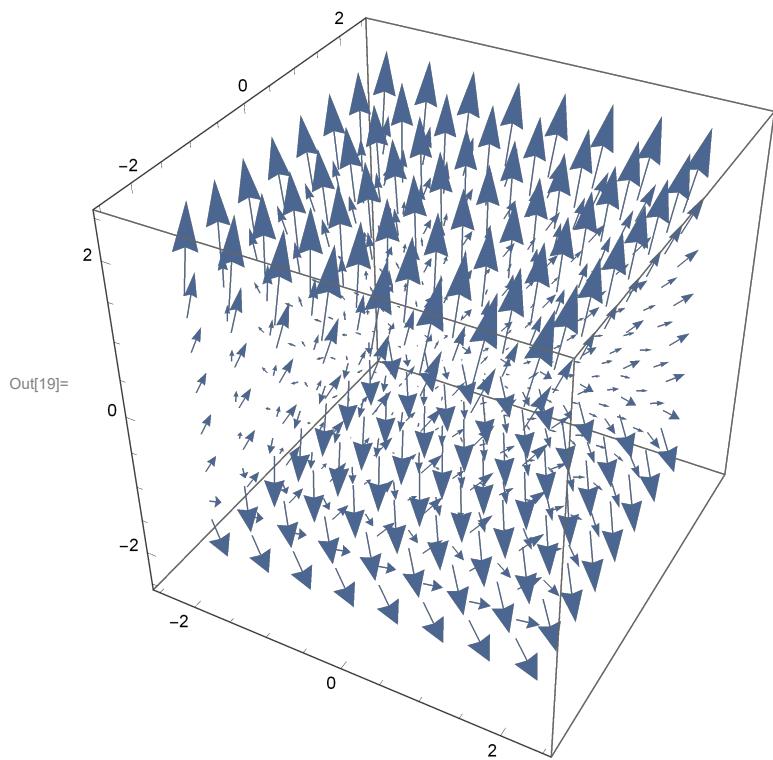
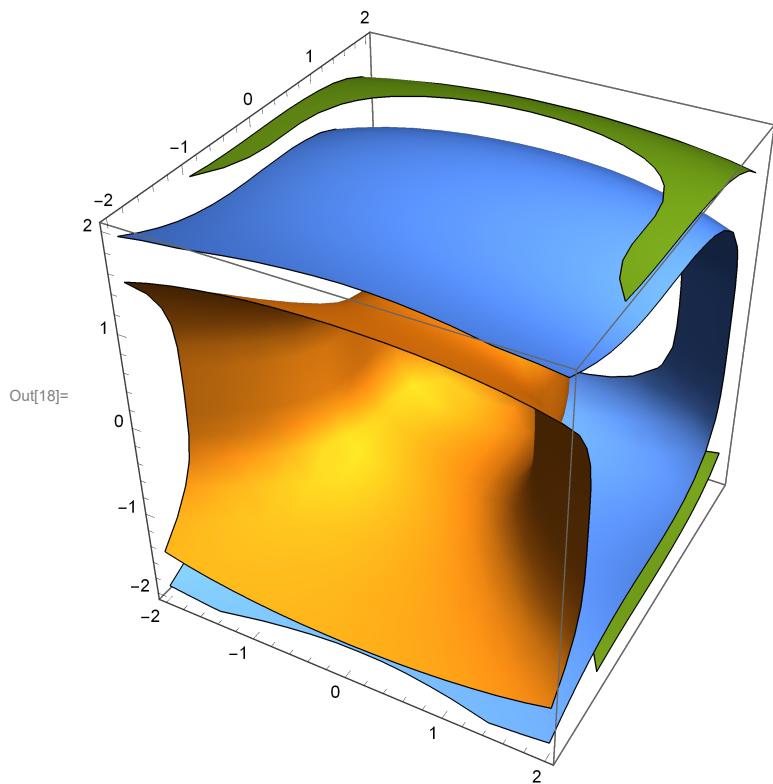
```
In[12]:= f[x_, y_, z_] := Sqrt[x^2 + y^2 + z^2];
grad = Grad[f[x, y, z], {x, y, z}]
ContourPlot3D[f[x, y, z], {x, -2, 2}, {y, -2, 2}, {z, -2, 2}, Mesh -> None]
VectorPlot3D[grad, {x, -2, 2}, {y, -2, 2}, {z, -2, 2}]
```

$$\text{Out}[13]= \left\{ \frac{x}{\sqrt{x^2 + y^2 + z^2}}, \frac{y}{\sqrt{x^2 + y^2 + z^2}}, \frac{z}{\sqrt{x^2 + y^2 + z^2}} \right\}$$

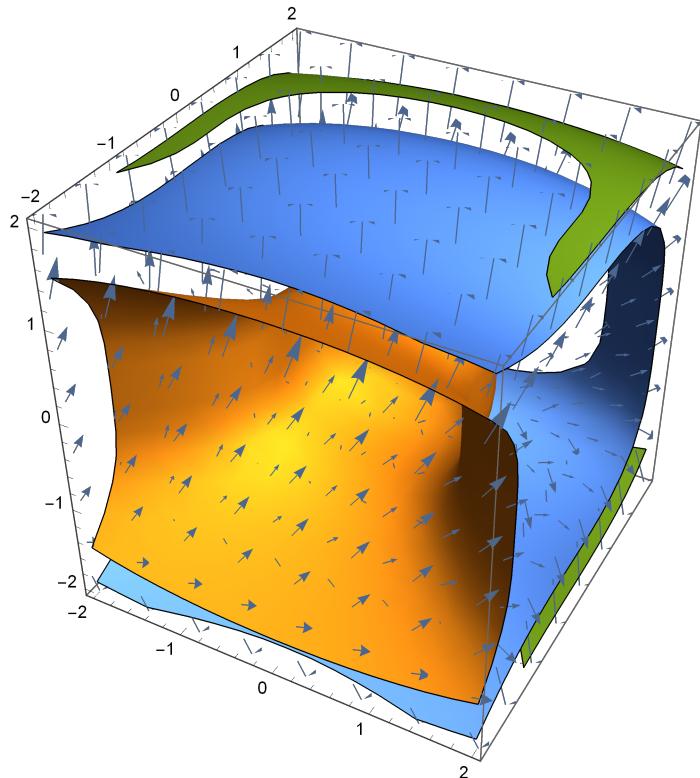


```
In[16]:= f[x_, y_, z_] := x^2 + y^3 + z^4;
grad = Grad[f[x, y, z], {x, y, z}]
ContourPlot3D[f[x, y, z], {x, -2, 2}, {y, -2, 2}, {z, -2, 2}, Mesh -> None]
VectorPlot3D[grad, {x, -2, 2}, {y, -2, 2}, {z, -2, 2}]
```

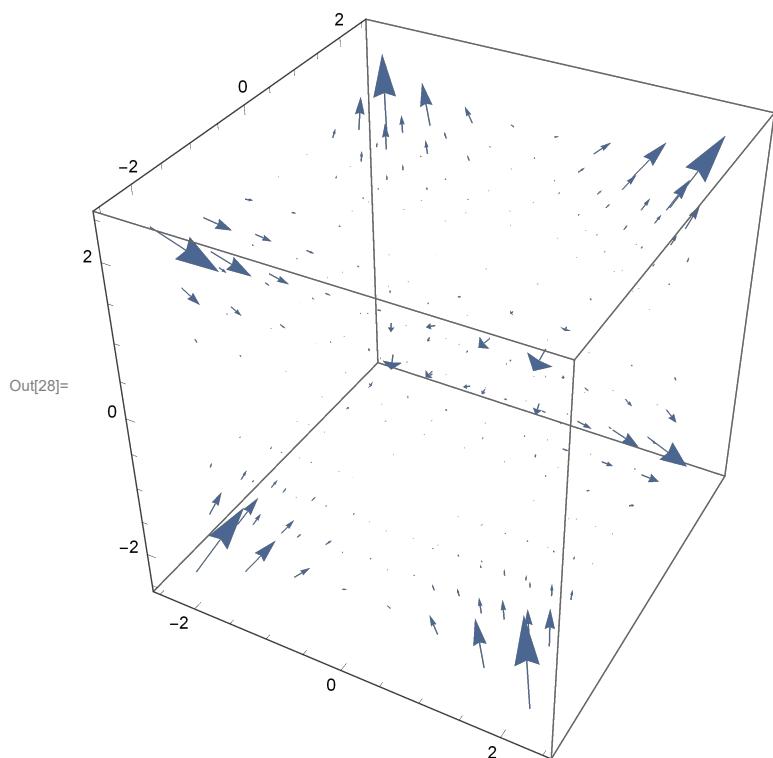
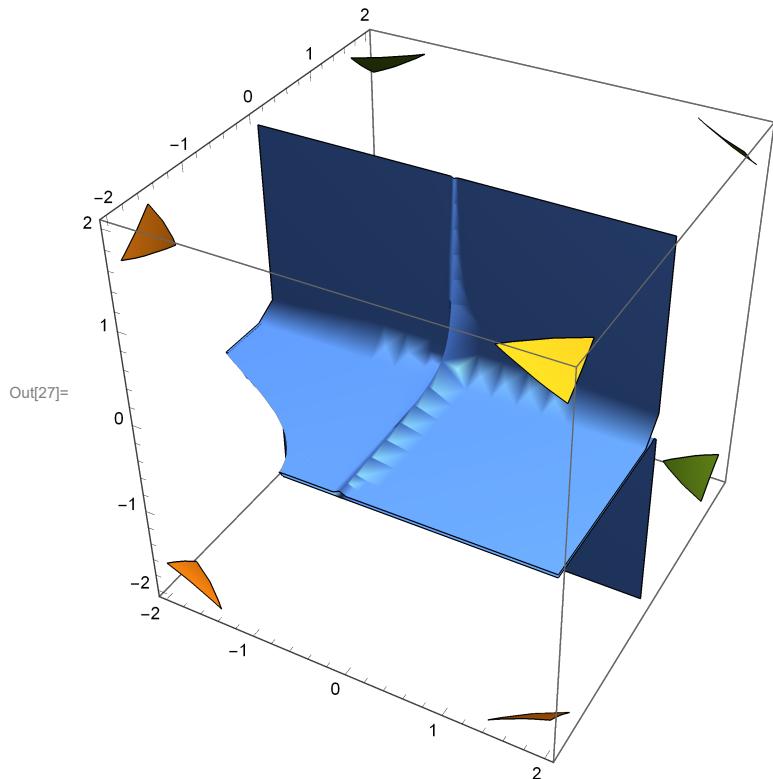
Out[17]= $\{2x, 3y^2, 4z^3\}$



```
In[20]:= f[x_, y_, z_] := x^2 + y^3 + z^4;
grad = Grad[f[x, y, z], {x, y, z}]
plot1 = ContourPlot3D[f[x, y, z], {x, -2, 2}, {y, -2, 2}, {z, -2, 2}, Mesh -> None];
plot2 = VectorPlot3D[grad, {x, -2, 2}, {y, -2, 2}, {z, -2, 2}];
Show[plot1, plot2]
Out[21]= {2 x, 3 y2, 4 z3}
```



```
In[25]:= f[x_, y_, z_] := x^2 y^3 z^4;
grad = Grad[f[x, y, z], {x, y, z}]
ContourPlot3D[f[x, y, z], {x, -2, 2}, {y, -2, 2}, {z, -2, 2}, Mesh -> None]
VectorPlot3D[grad, {x, -2, 2}, {y, -2, 2}, {z, -2, 2}]
Out[26]= {2 x y3 z4, 3 x2 y2 z4, 4 x2 y3 z3}
```



```
In[29]:= f[x_, y_, z_] := Exp[x] Sin[y] Log[z];
grad = Grad[f[x, y, z], {x, y, z}]
ContourPlot3D[f[x, y, z], {x, -2, 2}, {y, -2, 2}, {z, -2, 2}, Mesh -> None]
VectorPlot3D[grad, {x, -2, 2}, {y, -2, 2}, {z, -2, 2}]
```

$$\text{Out}[30]= \left\{ e^x \log[z] \sin[y], e^x \cos[y] \log[z], \frac{e^x \sin[y]}{z} \right\}$$

