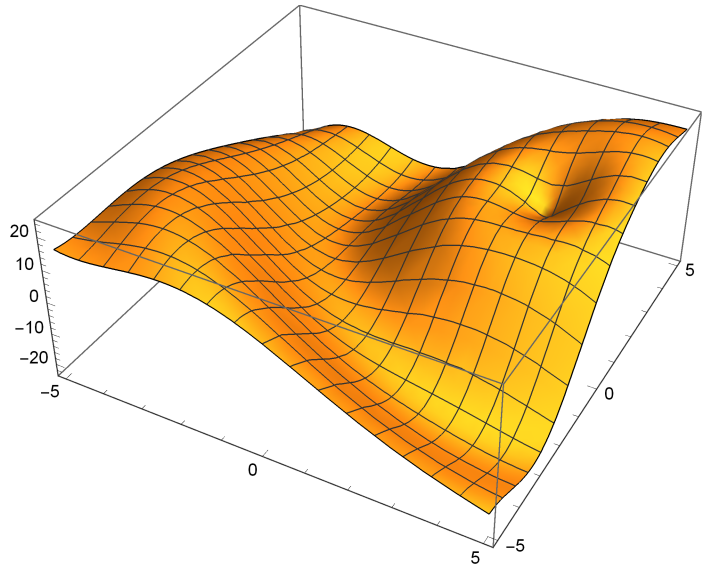
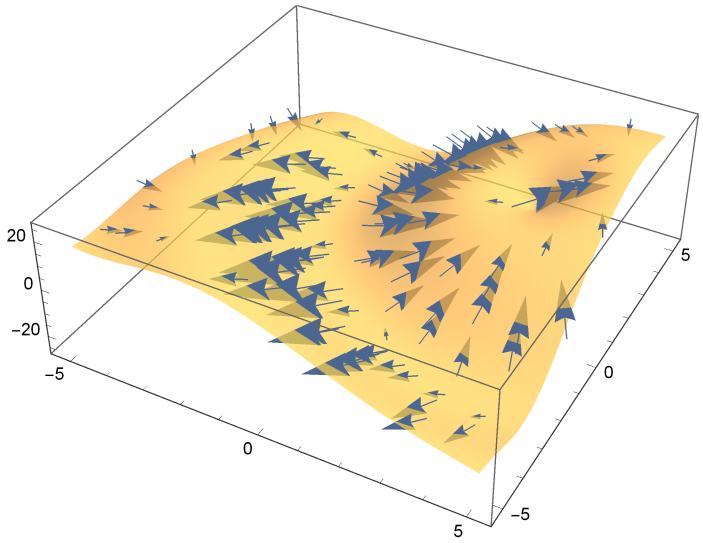
```
(* Define scalar field components *)
f[x_, y_] = 10 * Sin[Sqrt[(x - 3)^2 + (y - 2)^2]] + x * y
Plot3D[f[x, y], {x, -5, 5}, {y, -5, 5}]
grad[x_, y_] = Grad[f[x, y], {x, y}]
gradforplotting[x_, y_, z_] = Append[grad[x, y], 0]
SliceVectorPlot3D[gradforplotting[x, y, z], {z == f[x, y]}, {x, -5, 5},
 {y, -5, 5}, {z, -25, 25}, BoxRatios → {3, 3, 1}, VectorScale → {Tiny, Scaled[0.3]}]

(* Define vector field components *)
Fx[x_, y_, z_] = x^3 + y * z^2
Fy[x_, y_, z_] = y^3 - x * z^2
Fz[x_, y_, z_] = z^3

(* Define divergence of vector field *)
curl[x_, y_, z_] = Curl[{Fx[x, y, z], Fy[x, y, z], Fz[x, y, z]}, {x, y, z}]
div[x_, y_, z_] = Div[{Fx[x, y, z], Fy[x, y, z], Fz[x, y, z]}, {x, y, z}]

(* Make plots *)
VectorPlot3D[{Fx[x, y, z], Fy[x, y, z], Fz[x, y, z]},
 {x, -10, 10}, {y, -10, 10}, {z, -10, 10}]
VectorPlot3D[curl[x, y, z], {x, -10, 10}, {y, -10, 10}, {z, -10, 10}]
DensityPlot3D[div[x, y, z], {x, -10, 10}, {y, -10, 10}, {z, -10, 10},
 ColorFunction → "SunsetColors", OpacityFunction → Function[f, 0.1 * (1 - f)^2]]
```

$$x\,y + 10\,\text{Sin}\left[\sqrt{(-3+x)^2 + (-2+y)^2}\right]$$



$$\left\{y + \frac{10\,(-3+x)\,\text{Cos}\left[\sqrt{(-3+x)^2 + (-2+y)^2}\right]}{\sqrt{(-3+x)^2 + (-2+y)^2}},\ x + \frac{10\,(-2+y)\,\text{Cos}\left[\sqrt{(-3+x)^2 + (-2+y)^2}\right]}{\sqrt{(-3+x)^2 + (-2+y)^2}}\right\}$$

$$\left\{y + \frac{10\,(-3+x)\,\text{Cos}\left[\sqrt{(-3+x)^2 + (-2+y)^2}\right]}{\sqrt{(-3+x)^2 + (-2+y)^2}},\ x + \frac{10\,(-2+y)\,\text{Cos}\left[\sqrt{(-3+x)^2 + (-2+y)^2}\right]}{\sqrt{(-3+x)^2 + (-2+y)^2}},\ 0\right\}$$



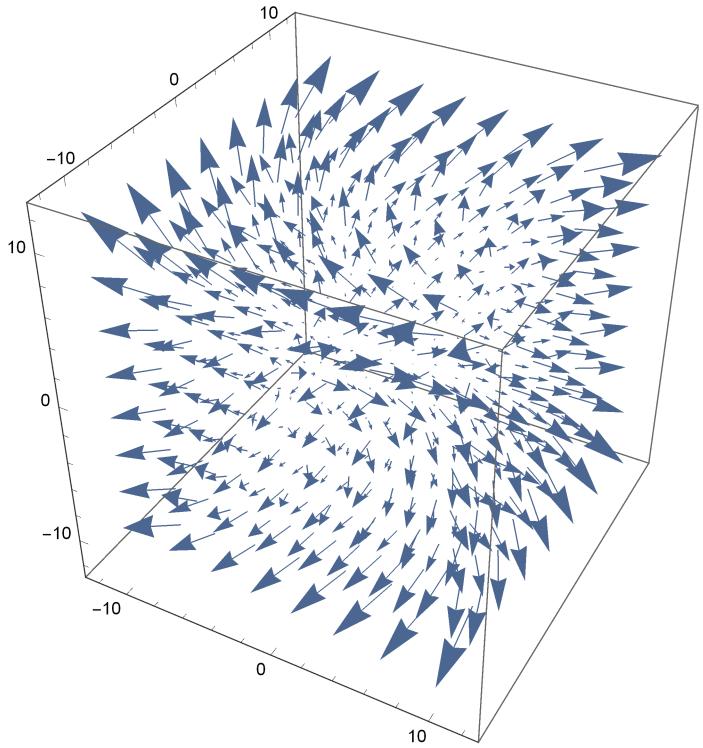
$x^3 + y\,z^2$

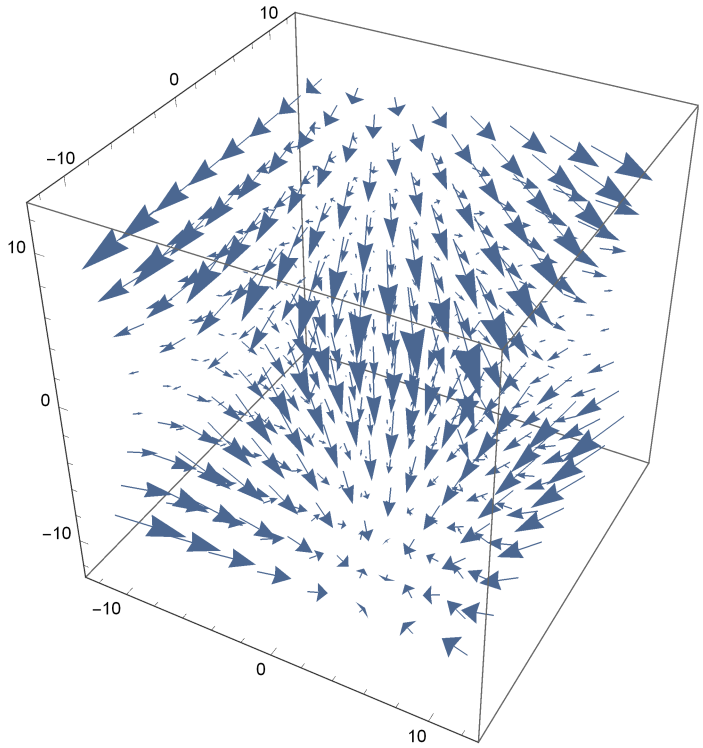
$y^3 - x\,z^2$

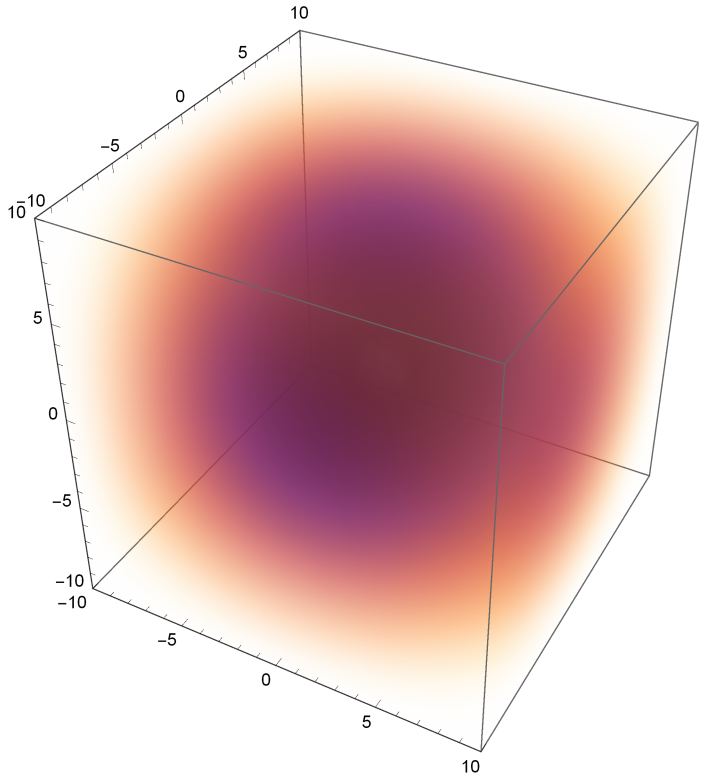
z^3

$\{2\,x\,z,\ 2\,y\,z,\ -2\,z^2\}$

$3\,x^2 + 3\,y^2 + 3\,z^2$




10
0
−10
10
0
−10
−10
0
10


10
5
0
−5
10
10
5
0
−5
−10
−10
−5
0
5
10