

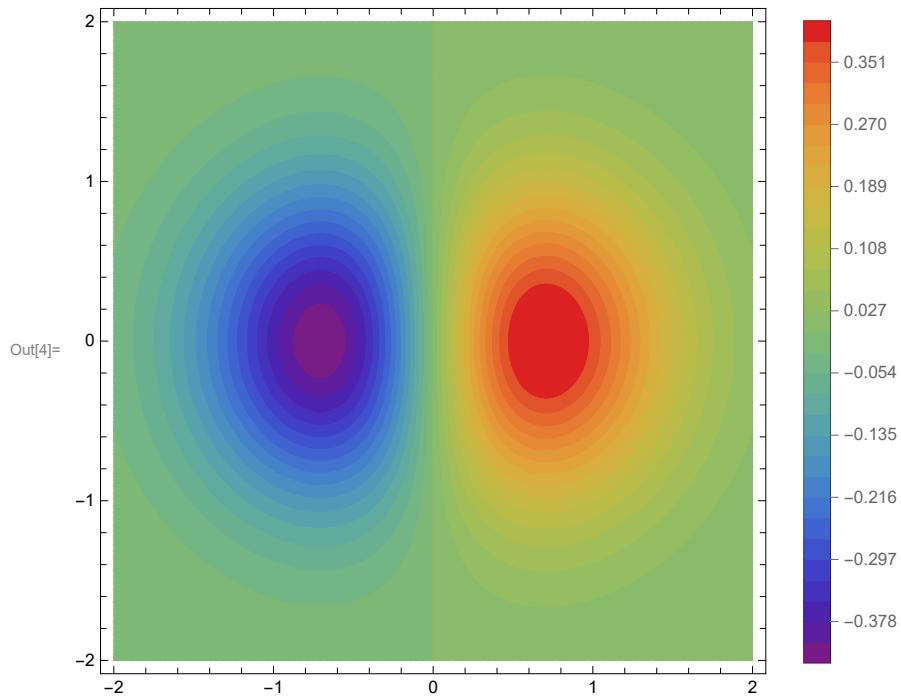
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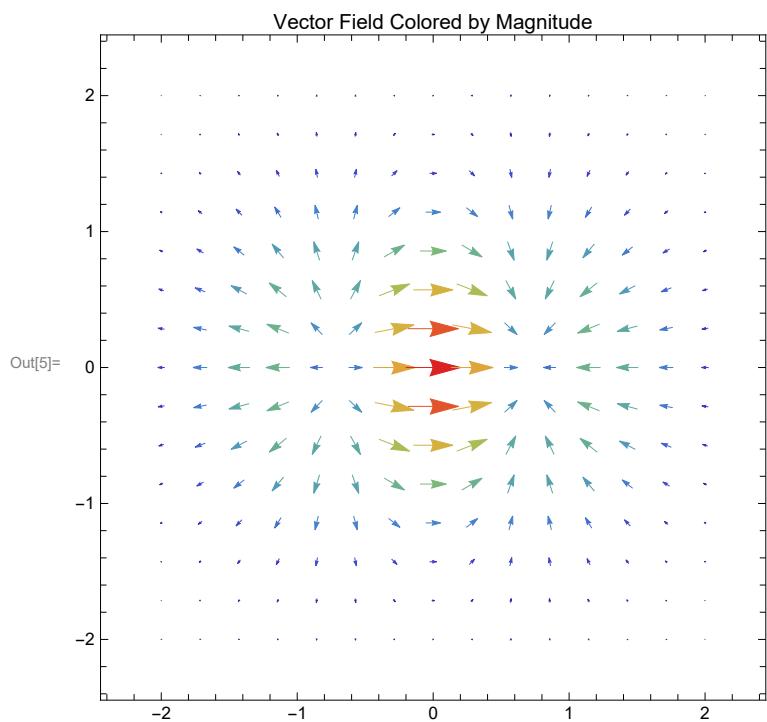
In[1]:= f[x_, y_] := x Exp[-(x^2 + y^2)];
A[x_, y_] = D[f[x, y], x]
B[x_, y_] = D[f[x, y], y]
ContourPlot[f[x, y], {x, -2, 2}, {y, -2, 2}, PlotPoints → 100, Contours → 30,
ContourStyle → None, PlotLegends → Automatic, ColorFunction → "Rainbow"]
VectorPlot[{A[x, y], B[x, y]}, {x, -2, 2}, {y, -2, 2},
VectorColorFunction → Function[{x, y, u, v, norm}, ColorData["Rainbow"] [norm]],
VectorColorFunctionScaling → True, PlotLabel → "Vector Field Colored by Magnitude"]

```

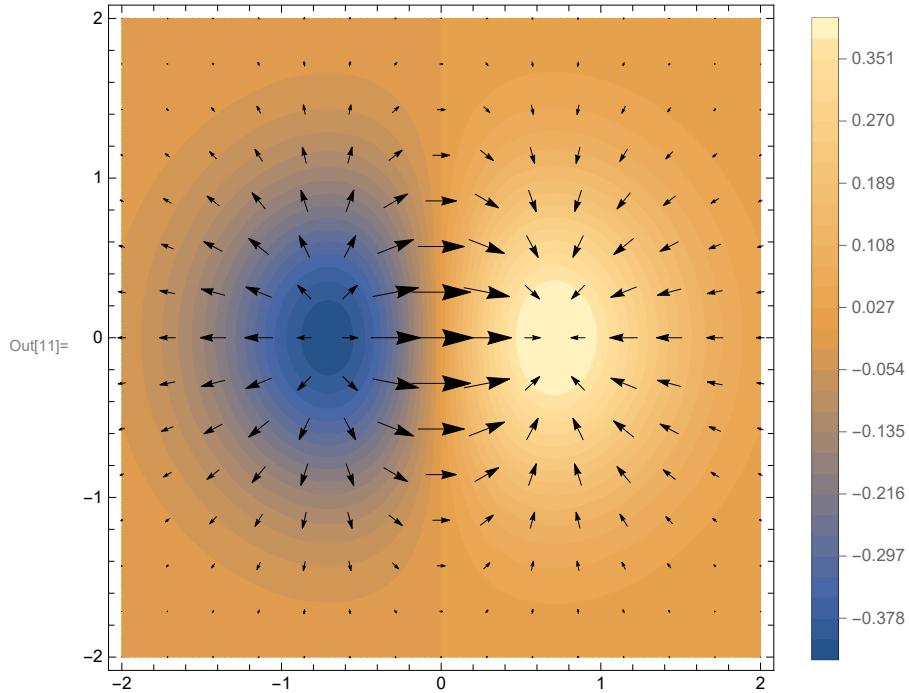
$$\text{Out}[2]= e^{-x^2-y^2} - 2 e^{-x^2-y^2} x^2$$

$$\text{Out}[3]= -2 e^{-x^2-y^2} x y$$

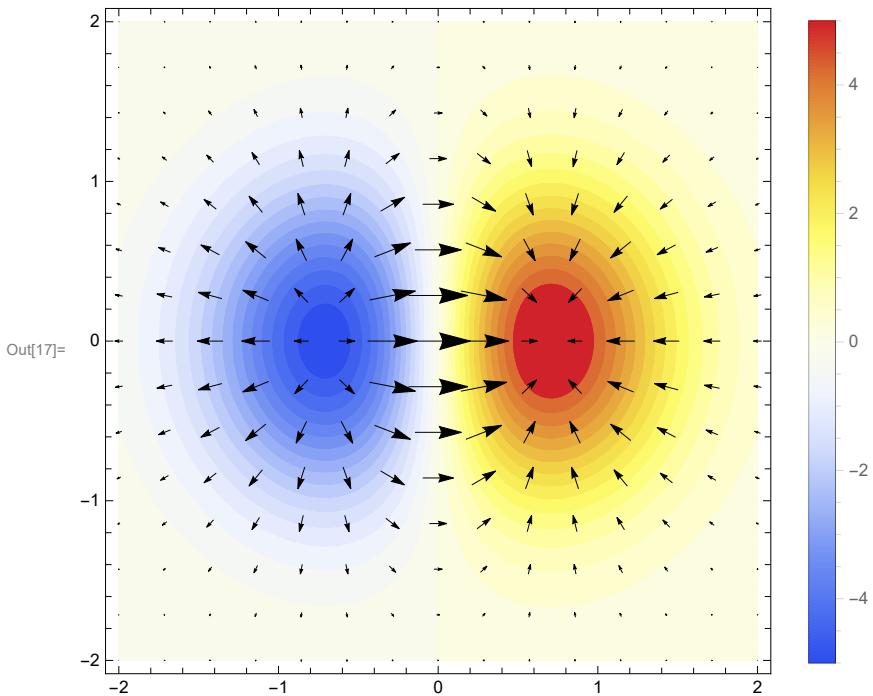




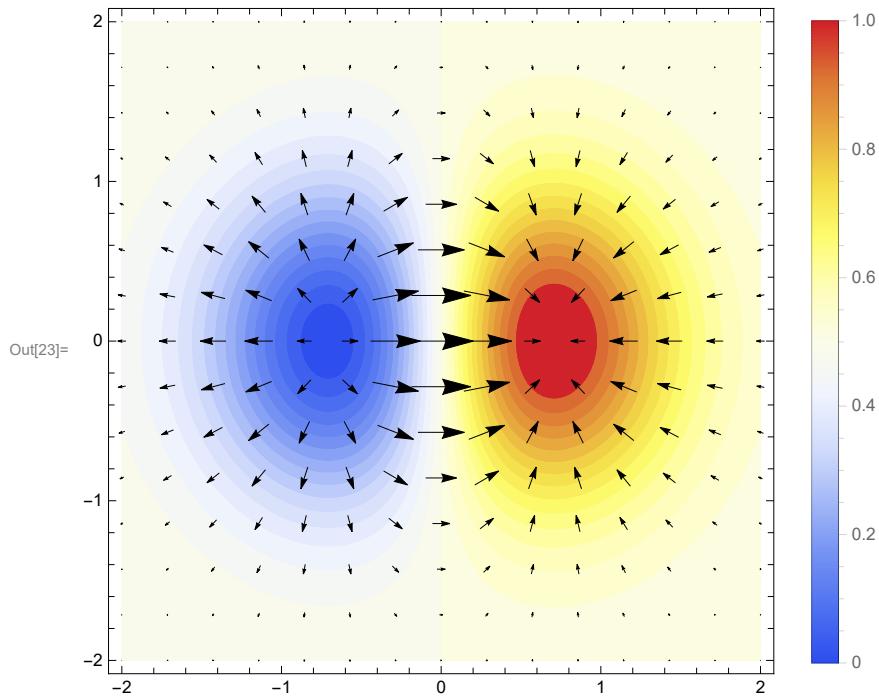
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In[6]:= f[x_, y_] := x Exp[-(x^2 + y^2)];  
A[x_, y_] = D[f[x, y], x]  
B[x_, y_] = D[f[x, y], y]  
plot1 = ContourPlot[f[x, y], {x, -2, 2}, {y, -2, 2},  
  PlotPoints → 100, Contours → 30, ContourStyle → None, PlotLegends → Automatic];  
plot2 = VectorPlot[{A[x, y], B[x, y]}, {x, -2, 2}, {y, -2, 2}, VectorStyle → Black];  
Show[plot1, plot2]  
  
Out[7]=  $e^{-x^2-y^2} - 2 e^{-x^2-y^2} x^2$   
  
Out[8]=  $-2 e^{-x^2-y^2} x y$ 
```



```
In[12]:= f[x_, y_] := x Exp[-(x^2 + y^2)];  
A = D[f[x, y], x]  
B = D[f[x, y], y]  
plot1 = ContourPlot[f[x, y], {x, -2, 2}, {y, -2, 2}, PlotPoints → 100, Contours → 30,  
ContourStyle → None, PlotLegends → BarLegend[{"TemperatureMap", {-5, 5}}],  
ColorFunction → "TemperatureMap"];  
plot2 = VectorPlot[{A, B}, {x, -2, 2}, {y, -2, 2}, VectorStyle → Black];  
Show[plot1, plot2]  
  
Out[13]=  $e^{-x^2-y^2} - 2 e^{-x^2-y^2} x^2$   
  
Out[14]=  $-2 e^{-x^2-y^2} x y$ 
```



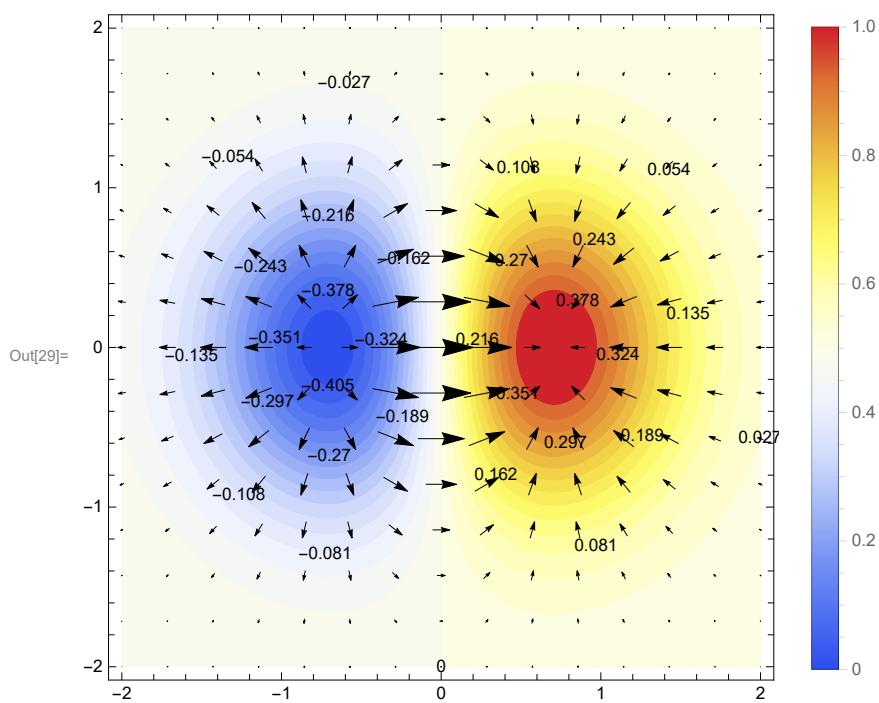
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In[18]:= f[x_, y_] := x Exp[-(x^2 + y^2)];  
A = D[f[x, y], x]  
B = D[f[x, y], y]  
plot1 = ContourPlot[f[x, y], {x, -2, 2},  
{y, -2, 2}, PlotPoints → 100, Contours → 30, ContourStyle → None,  
PlotLegends → BarLegend[{"TemperatureMap", {0, 1}}], ColorFunction → "TemperatureMap"];  
plot2 = VectorPlot[{A, B}, {x, -2, 2}, {y, -2, 2}, VectorStyle → Black];  
Show[plot1, plot2]  
Out[19]=  $e^{-x^2-y^2} - 2 e^{-x^2-y^2} x^2$   
Out[20]=  $-2 e^{-x^2-y^2} x y$ 
```



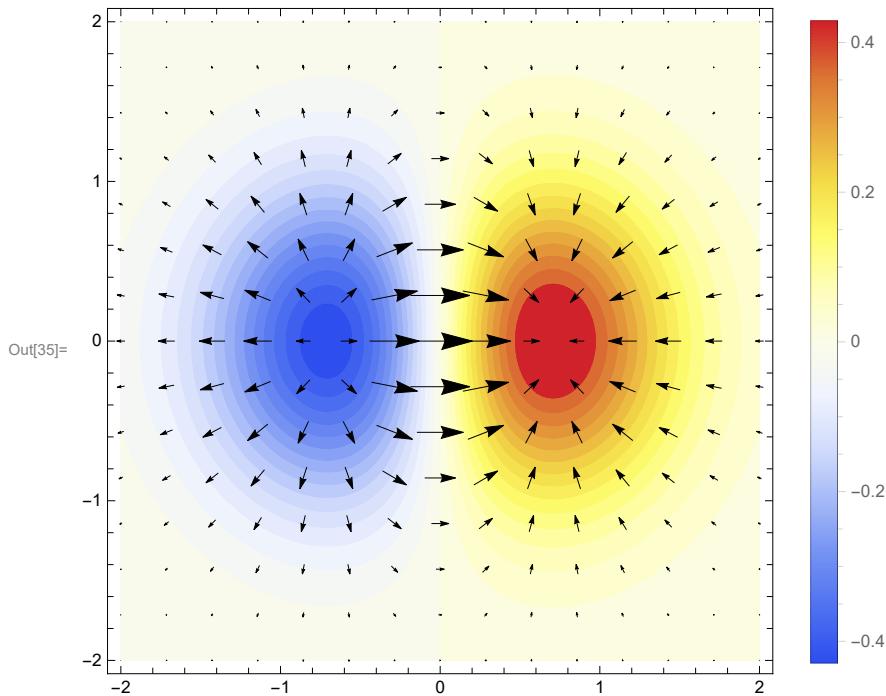
```
In[24]:= f[x_, y_] := x Exp[-(x^2 + y^2)];
A = D[f[x, y], x]
B = D[f[x, y], y]
plot1 = ContourPlot[f[x, y], {x, -2, 2}, {y, -2, 2},
  PlotPoints → 100, Contours → 30, ContourStyle → None, ContourLabels → True,
  PlotLegends → BarLegend[{"TemperatureMap", {0, 1}}], (*Setting range in legend
  may show wrong data from the plot*) ColorFunction → "TemperatureMap"];
plot2 = VectorPlot[{A, B}, {x, -2, 2}, {y, -2, 2}, VectorStyle → Black];
Show[plot1, plot2]

Out[25]= e-x2-y2 - 2 e-x2-y2 x2

Out[26]= -2 e-x2-y2 x y
```



```
In[30]:= f[x_, y_] := x Exp[-(x^2 + y^2)];
A = D[f[x, y], x]
B = D[f[x, y], y]
plot1 = ContourPlot[f[x, y], {x, -2, 2},
{y, -2, 2}, PlotPoints → 100, Contours → 30, ContourStyle → None,
PlotLegends → BarLegend[Automatic, None], ColorFunction → "TemperatureMap"];
plot2 = VectorPlot[{A, B}, {x, -2, 2}, {y, -2, 2}, VectorStyle → Black];
Show[plot1, plot2]
Out[31]= e-x2-y2 - 2 e-x2-y2 x2
Out[32]= -2 e-x2-y2 x y
```



```
In[36]:= f[x_, y_] := x Exp[-(x^2 + y^2)];  
A = D[f[x, y], x]  
B = D[f[x, y], y]  
plot1 = ContourPlot[f[x, y], {x, -2, 2}, {y, -2, 2}, PlotPoints → 100, Contours → 30,  
ContourStyle → None, PlotLegends → Automatic, ColorFunction → "TemperatureMap"];  
plot2 = VectorPlot[{A, B}, {x, -2, 2}, {y, -2, 2}, VectorStyle → Black];  
Show[plot1, plot2]  
  
Out[37]=  $e^{-x^2-y^2} - 2 e^{-x^2-y^2} x^2$   
  
Out[38]=  $-2 e^{-x^2-y^2} x y$ 
```

