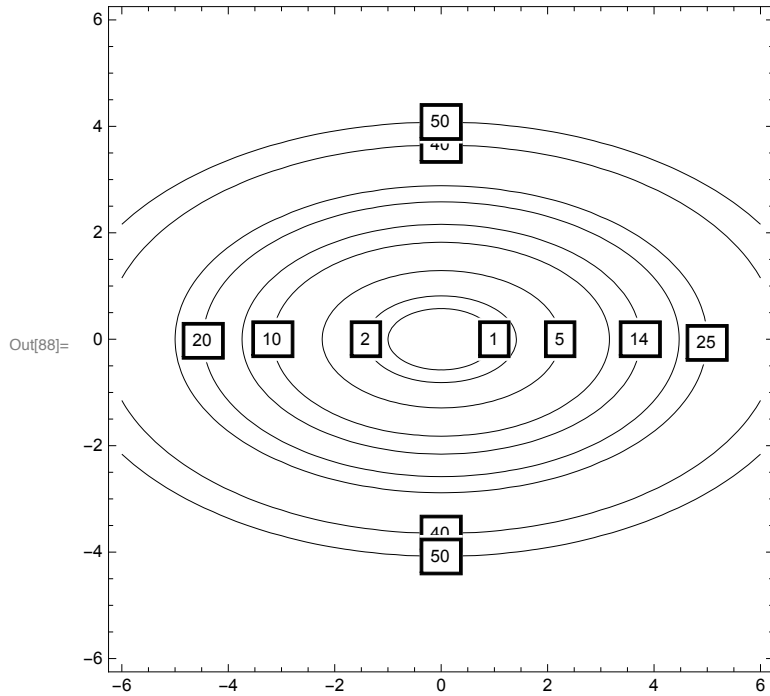


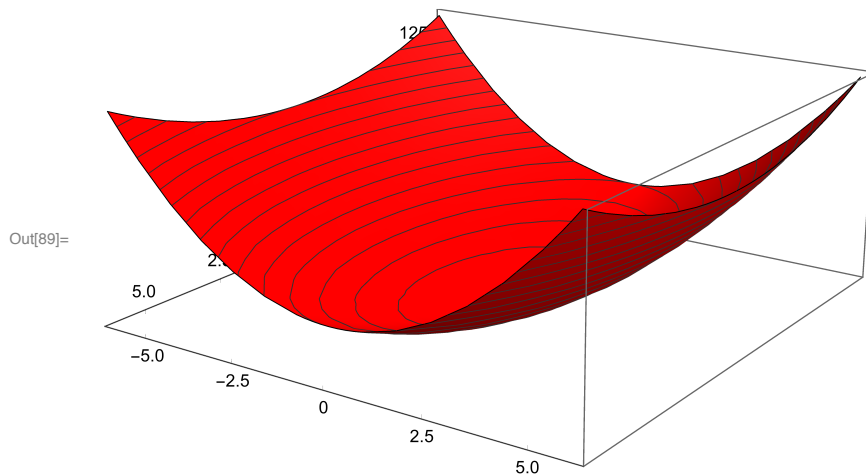
```
In[86]:= f[x_, y_] := x^2 + 3 * y^2;  
contours = {-20, -15, -10, -8, -4, -3, -2, 0, 1, 2, 5, 10, 14, 20, 25, 40, 50};
```

(* Plot the level curve diagram for $f(x,y)$ with contours specified by the list 'contours' given above*)

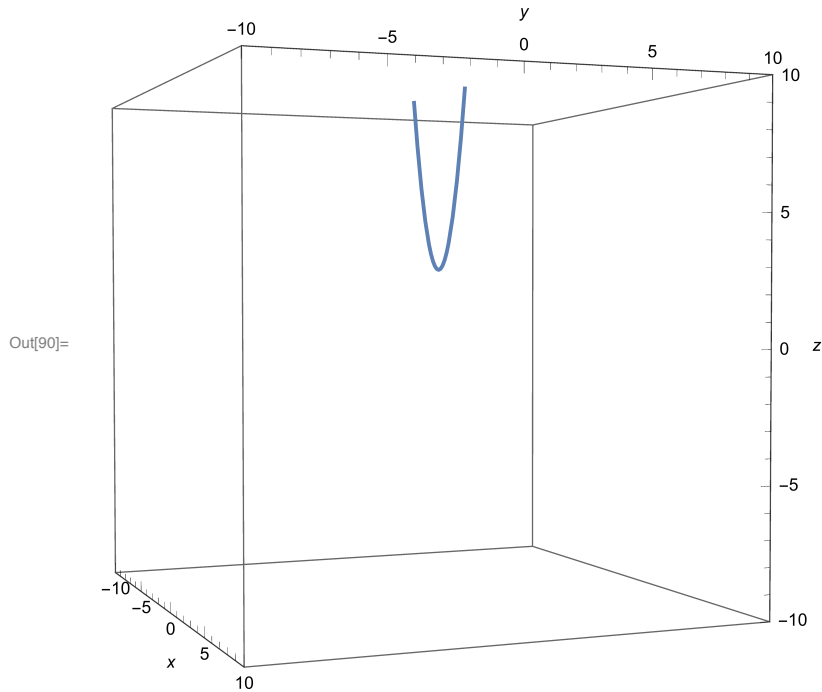
```
Show[ContourPlot[f[x, y], {x, -6, 6}, {y, -6, 6}, Contours -> contours, ContourShading ->  
None, ContourLabels -> (Text[Framed[#3], {#1, #2}, Background -> White] &)]]
```



```
In[89]:= (* Plot the graph z=f(x,y) *)  
Plot3D[f[x, y], {x, -6, 6}, {y, -6, 6}, PlotStyle -> Red, PlotTheme -> "Web"]
```



```
In[90]:= (* Plot the trace of z=f(x,y) with the plane y=1 *)
ParametricPlot3D[{u, 1, f[u, 1]},
  {u, -10, 10}, PlotRange -> {-10, 10}, AxesLabel -> {x, y, z}]
```



```
In[91]:= (* Plot the trace of z=f(x,y) with the plane y=1 and the graph z=f(x,y) *)
Show[Plot3D[f[x, y], {x, -6, 6}, {y, -6, 6},
  PlotStyle -> {Red, Opacity[0.3]}, PlotTheme -> "Web"],
  ParametricPlot3D[{u, 1, f[u, 1]}, {u, -10, 10}, PlotRange -> {-10, 10},
  AxesLabel -> {x, y, z}, PlotStyle -> Thickness[0.01]]
]
```

