

Maths for ML II

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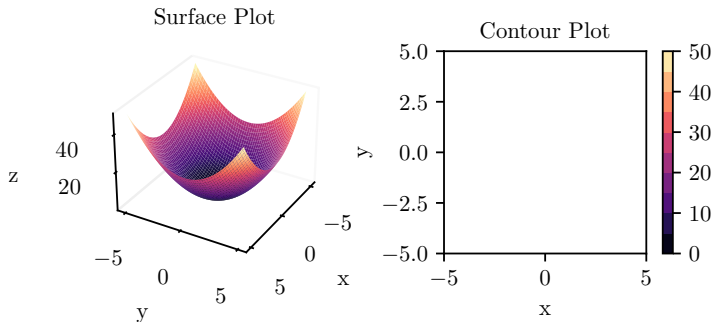
January 2, 2024

IIT Gandhinagar

Contour Plot

$$z = f(x, y) = x^2 + y^2$$

Notebook: [contour.html](#)

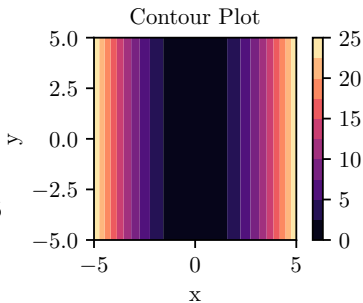
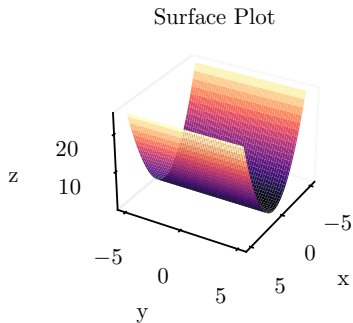


Then plot $f(x, y) = K$ for varying K .

Contour Plot

$$z = f(x, y) = x^2$$

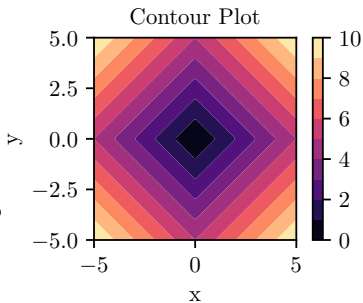
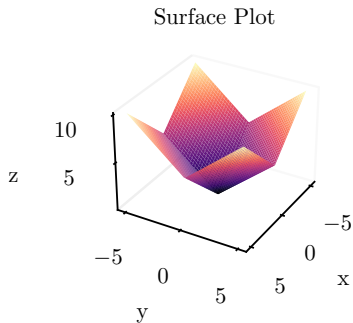
Notebook: [contour.html](#)



Contour Plot

$$z = f(x, y) = |x| + |y|$$

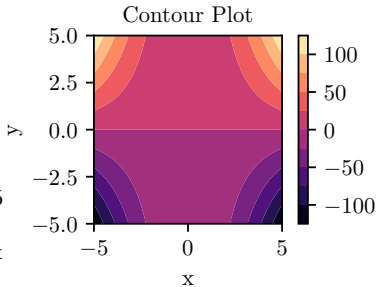
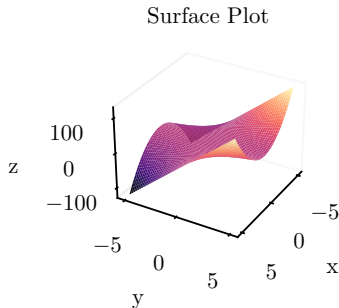
Notebook: [contour.html](#)



Contour Plot

$$z = f(x, y) = (x^2) * y$$

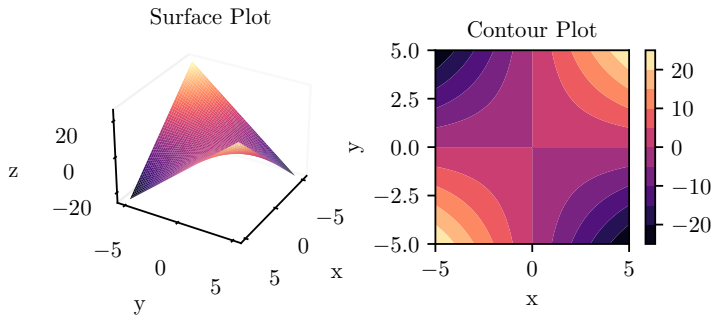
Notebook: [contour.html](#)



Contour Plot

$$z = f(x, y) = xy$$

Notebook: [contour.html](#)



Contours plots and gradients

Gradient denotes the steepest change.

All points on the contour have the same $f(x, y)$

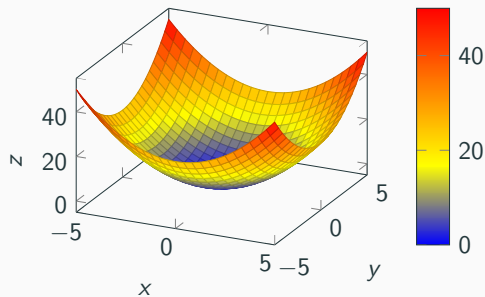
Contour Plot And Gradients

$$z = f(x, y) = x^2 + y^2$$

Contour Plot And Gradients

$$z = f(x, y) = x^2 + y^2$$

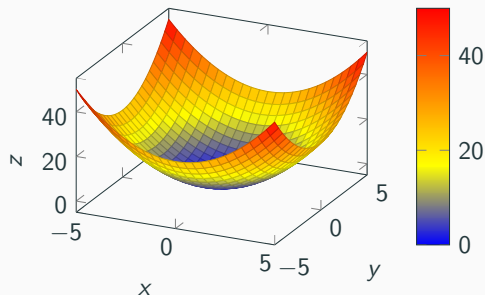
Surface Plot



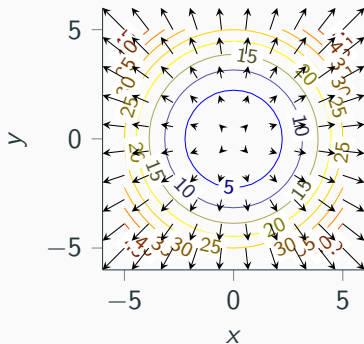
Contour Plot And Gradients

$$z = f(x, y) = x^2 + y^2$$

Surface Plot



Contour plot, view from top



Then plot $f(x, y) = K$ for varying K.

Contour Plots and Gradients

Gradient denotes the direction of steepest descent.

All points on the contour have the same $f(x,y)$.

Gradient denotes the direction in which there is a maximum increase in $f(x,y)$