

Maths for ML II

Nipun Batra

December 26, 2023

IIT Gandhinagar

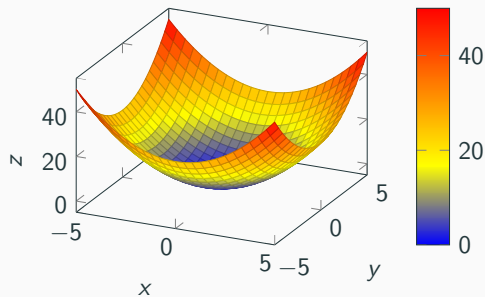
Contour Plot

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

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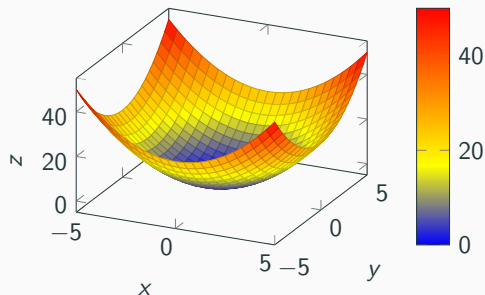
Surface Plot



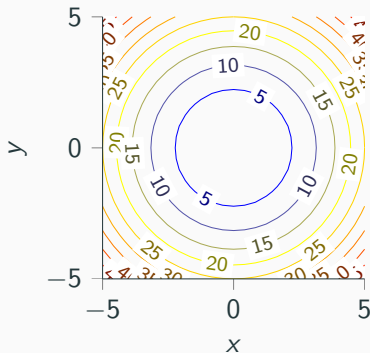
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Surface Plot

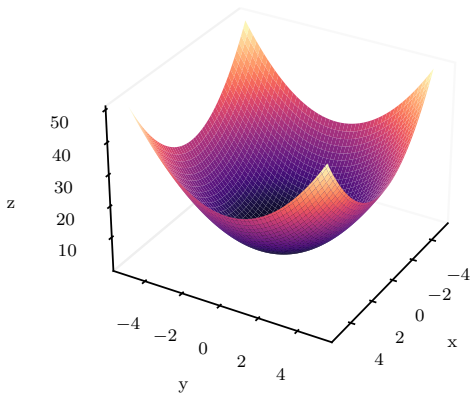


Contour plot, view from top

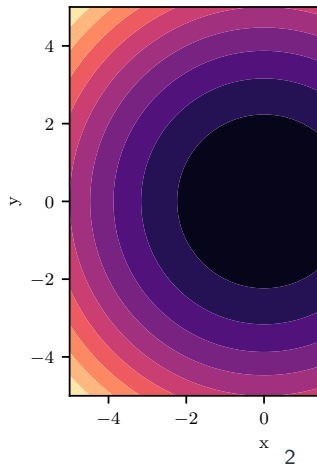


Then plot $f(x, y) = K$ for varying K .

Surface Plot



Contour Plot, View f



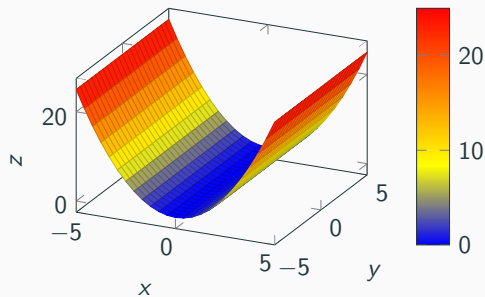
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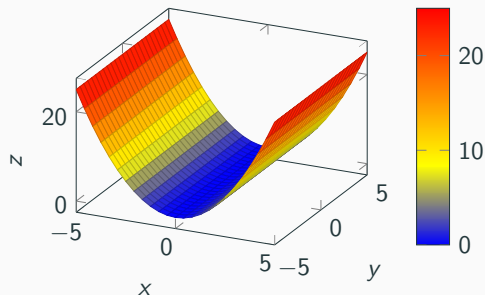
Surface Plot



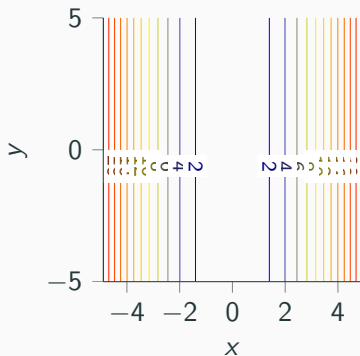
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Surface Plot



Contour plot, view from top



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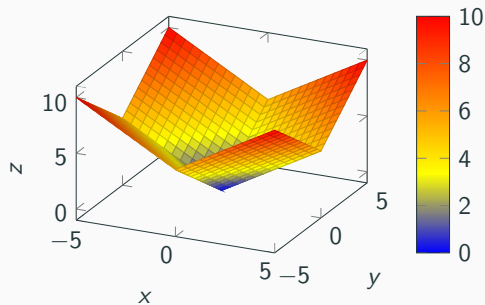
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$$z = f(x, y) = |x| + |y|$$

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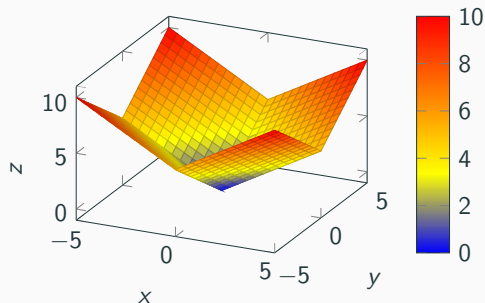
Surface Plot



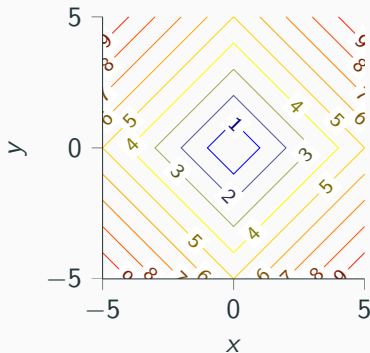
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Surface Plot



Contour plot, view from top



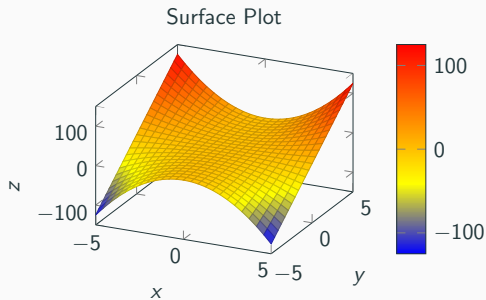
Then plot $f(x, y) = K$ for varying K .

Contour Plot

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

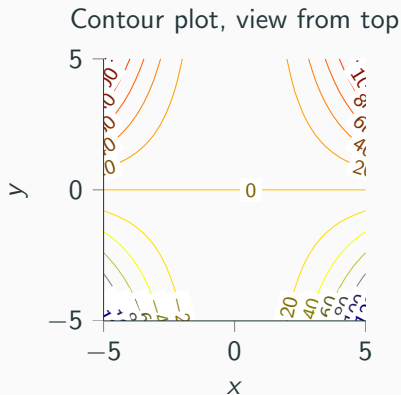
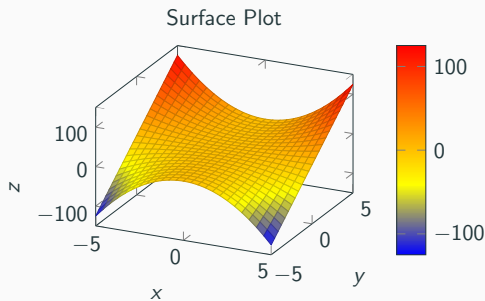
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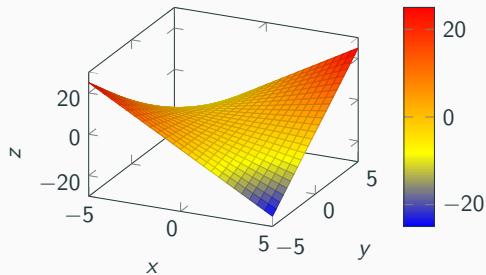
Contour Plot

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

Contour Plot

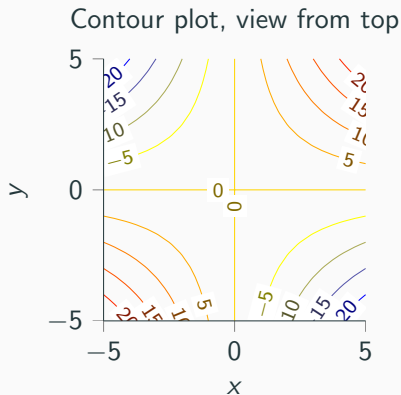
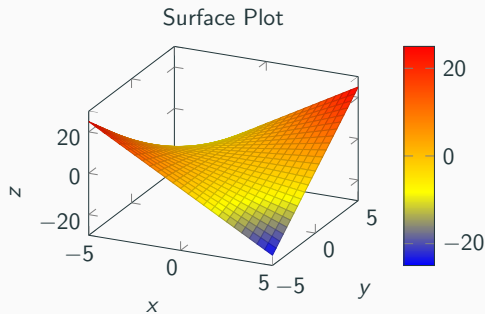
$$z = f(x, y) = xy$$

Surface Plot



Contour Plot

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



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

Contours plots and gradients

Gradient denotes the steepest change.

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

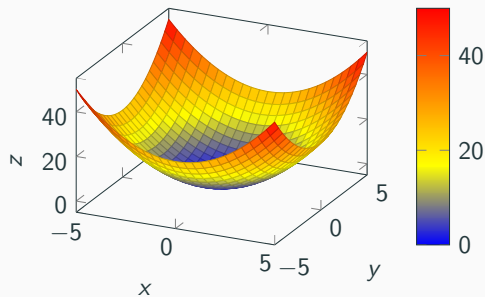
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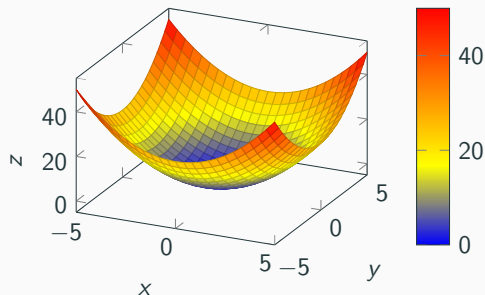
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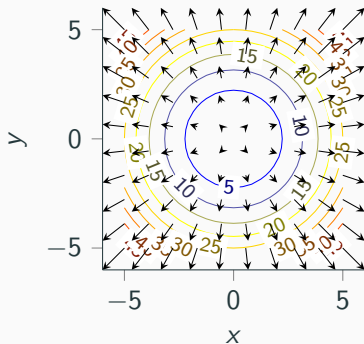
Contour Plot And Gradients

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

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 $f(x,y)$