

Maths for ML II

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IIT Gandhinagar

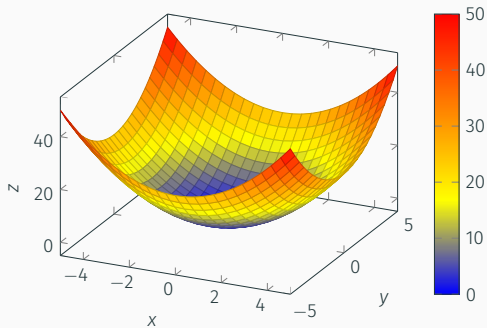
Contour Plot

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

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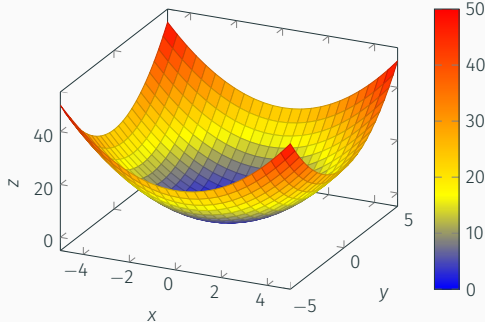
Surface Plot



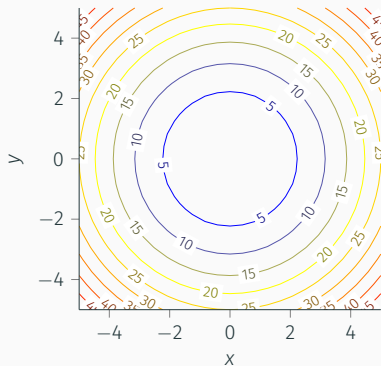
Contour Plot

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

Surface Plot



Contour plot, view from top



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

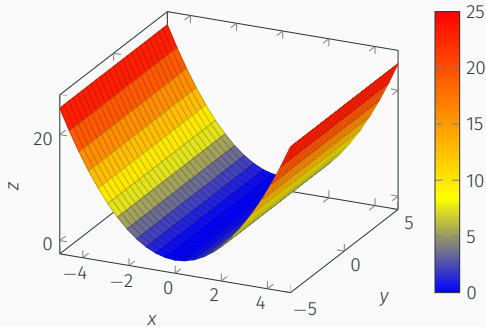
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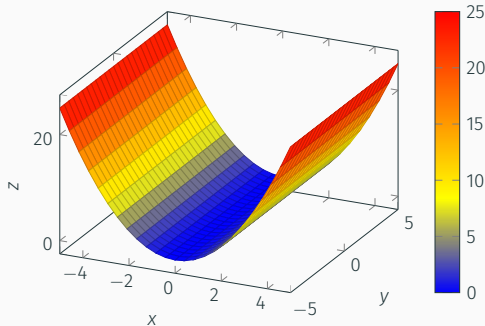
Surface Plot



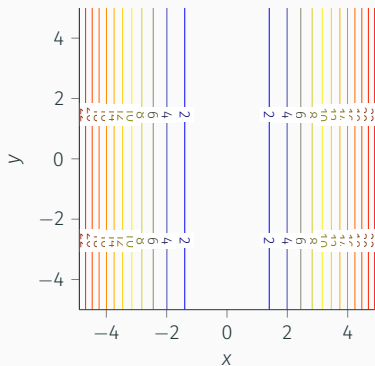
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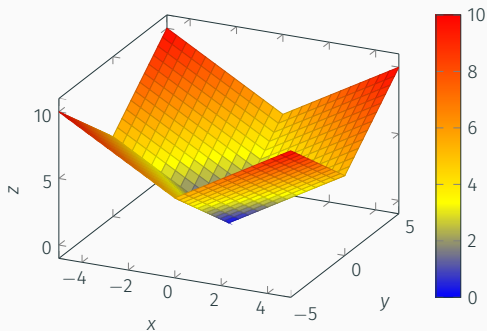
Contour Plot

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

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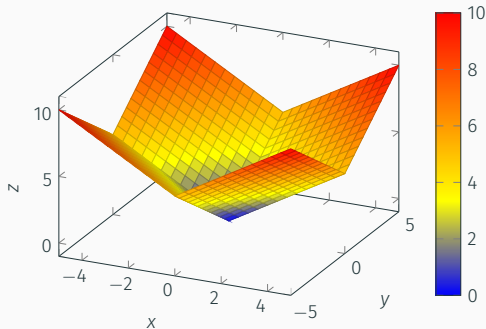
Surface Plot



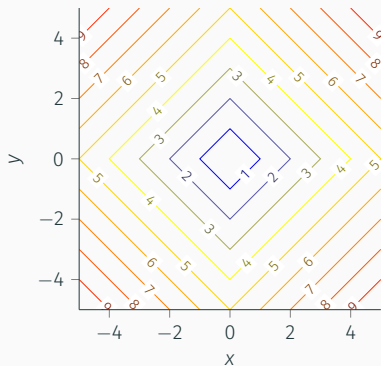
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Contour plot, view from top



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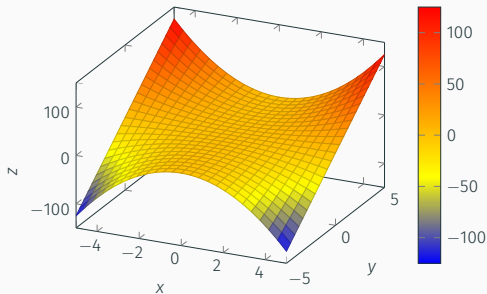
Contour Plot

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

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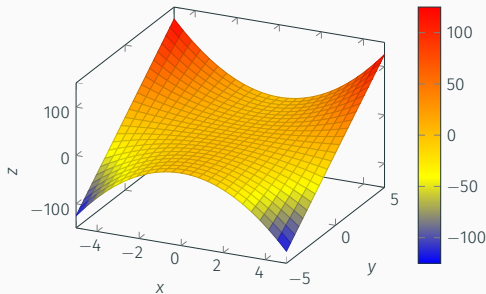
Surface Plot



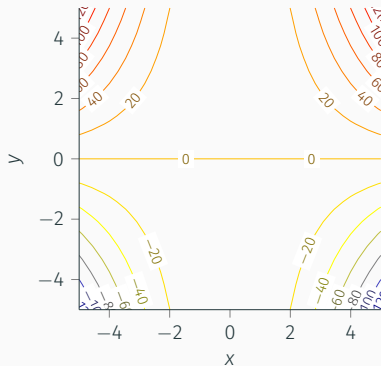
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Surface Plot



Contour plot, view from top



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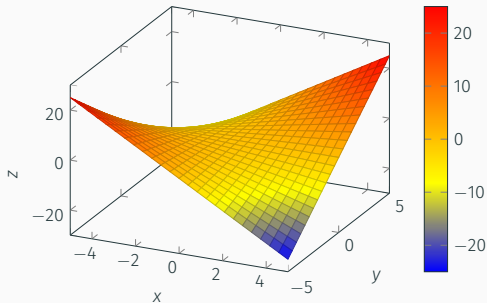
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$$z = f(x, y) = xy$$

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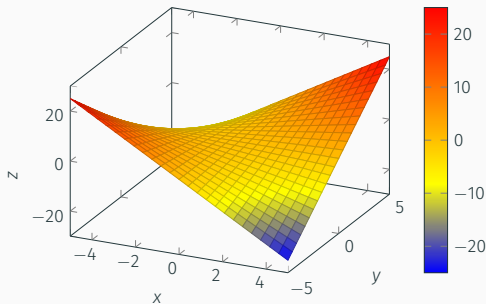
Surface Plot



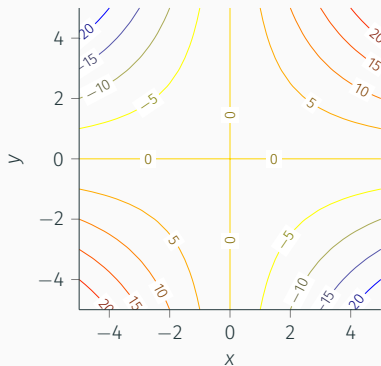
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$$z = f(x, y) = xy$$

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Contour plot, view from top



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 $f(x,y)$

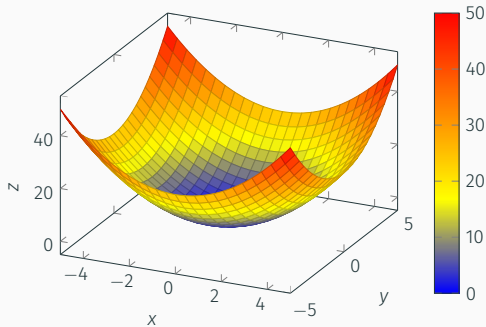
Contour Plot And Gradients

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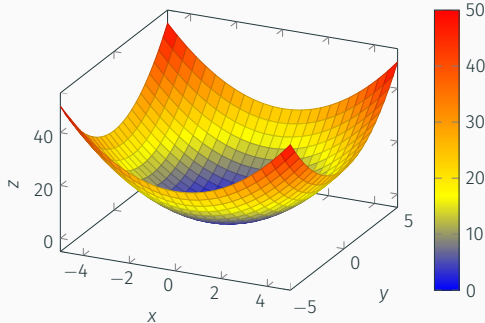
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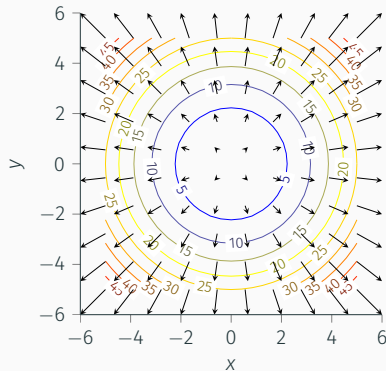
Contour Plot And Gradients

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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 $f(x,y)$