

# unit1 function of two variables

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## 1 Lecture 1 : Level Curve and Parial Derivatives

Read summary Lec1 level curves and partial derivatives

Partial derivative Geometric meaning : The partial derivative with respect to  $x$  evaluated at point  $x_0, y_0$  can be approximated by :

$$f_x(x_0, y_0) = \frac{f(x_0 + \Delta x, y_0) - f(x_0, y_0)}{\Delta x}$$

So partial derivative of  $x$  measures how  $f$  changes if we increase  $x$  by small amount

similarly partial derivative with respect to  $y$  at point  $(x_0, y_0)$  is given by

$$f_y = \frac{f(x_0, y_0 + \Delta y) - f(x_0, y_0)}{\Delta y}$$

So partial derivative of  $y$  measures how  $f$  changes if we increase  $y$  by small amount

## 2 Lecture 2 : Linear Approximation and Tangent Planes

Read Summary Lec2 linear approx and tangent planes