If $f(x, y)$ is a function, where f partially depends on x and y and if we differentiate f with respect to x and y then the derivatives are called the partial derivative of f. The formula for partial derivative of f with respect to x taking y as a constant is given by:

$$f_x = \frac{\partial f}{\partial x} = \lim_{h \to 0} \frac{f(x + h, y) - f(x, y)}{h}$$

and partial derivative of f with respect to y taking x as a constant is given by:

$$f_y = \frac{\partial f}{\partial y} = \lim_{h \to 0} \frac{f(x, y + h) - f(x, y)}{h}$$

Consider the following function: $f(x, y) = x^2 y$ Then the partial derivative of f with respect to x is given by:

$$f_x = \frac{\partial f}{\partial x}$$
$$= \frac{\partial}{\partial x}(x^2 y)$$
$$= 2xy$$

$$f_y = \frac{\partial f}{\partial y}$$
$$= \frac{\partial}{\partial y}(x^2 y)$$
$$= x^2$$