

Answer on Question #52223 – Math – Multivariable Calculus

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

find

$$f'_y$$

Solution

Let's compute the partial derivative of function f with respect to y , with x held constant:

$$f'_y = \frac{\partial f}{\partial y} = \frac{\partial(2x^2y - 2y^2)}{\partial y} = \frac{\partial(2x^2y)}{\partial y} - \frac{\partial(2y^2)}{\partial y} = 2x^2 \frac{\partial y}{\partial y} - 2 \frac{\partial(y^2)}{\partial y} = 2x^2 - 4y.$$

The rules work the same way here as it does with functions of one variable:

$$\frac{\partial(g - h)}{\partial y} = \frac{\partial g}{\partial y} - \frac{\partial h}{\partial y},$$

$$\frac{\partial(Ay)}{\partial y} = A \frac{\partial y}{\partial y}, \text{ where } A \text{ is a constant with respect to } y;$$

$$\frac{\partial(y^n)}{\partial y} = ny^{n-1}, \text{ where } n \text{ is integer.}$$