Answer on Question #85564 – Math – Calculus

Question

Obtain all the first and second order partial derivatives of the function

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

Solution

$$f_x(x,y) = (x^2 + y^2)'_x = 2x + 0 = 2x$$

$$f_y(x,y) = (x^2 + y^2)'_y = 0 + 2y = 2y$$

$$f_{xx}(x,y) = f_{x^2}(x,y) = (x^2 + y^2)'_{xx} = (2x + 0)'_x = 2$$

$$f_{yy}(x,y) = f_{y^2}(x,y) = (x^2 + y^2)'_{yy} = (2y + 0)'_y = 2$$

$$f_{xy}(x,y) = f_{yx}(x,y) = (x^2 + y^2)'_{xy} = (2x + 0)'_y = 0$$

Answer:

$$f_x(x, y) = 2x$$

$$f_y(x, y) = 2y$$

$$f_{xx}(x, y) = 2$$

$$f_{yy}(x, y) = 2$$

$$f_{xy}(x, y) = f_{yx}(x, y) = 0$$

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