

Example 1

Find the limit, if it exists.

$$\lim_{(x,y) \rightarrow (-7,1)} \frac{xy \cos(x+7y)}{e^{x^2+y^2}}$$

Example 2

Find the limit, if it exists.

$$\lim_{(x,y) \rightarrow (0,0)} \frac{x^2 - xy}{\sqrt{x} - \sqrt{y}}$$

Example 3

Show that the limit does not exist.

$$\lim_{(x,y) \rightarrow (0,0)} \frac{x^2 - y^2}{x^2 + y^2}$$

Example 4

Show that the limit does not exist.

$$\lim_{(x,y) \rightarrow (0,0)} \frac{xy}{x^2 + y^2}$$

Example 5

Find the first partial derivatives of $f(x, y, z) = x \arctan(yz)$

Example 6

Given,

$$f(x, y) = \int_y^x \cos(-8t^2 - 2t + 2) dt$$

Find, $f_x(x, y), f_y(x, y)$

Example 3.5

Show that the limit does not exist.

$$\lim_{(x,y) \rightarrow (0,0)} \frac{2x^2}{x^2 + y^2}$$