

Taker Name:

Key

GTID: 90

Section:

Grader #1:

GTID: 90

§14.3: Partial derivatives

Find all second-order partial derivatives f_{xx} , f_{xy} , f_{yx} , f_{yy} for the given function.

$$f(x, y) = \cos xy$$

$$f_x = \frac{\partial}{\partial x} f = -y \sin xy$$

$$f_y = \frac{\partial}{\partial y} f = -x \sin xy$$

$$f_{xx} = \frac{\partial}{\partial x} f_x = -y^2 \cos xy$$

$$\begin{aligned} f_{xy} &= \frac{\partial}{\partial y} f_x = (-y)(x \cos xy) + (-1)(\sin xy) \\ &= -xy \cos xy - \sin xy = f_{yx} \end{aligned}$$

(by THM)

$$f_{yy} = \frac{\partial}{\partial y} f_y = -x^2 \cos xy$$

A

J

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G2:

A

J

N

G3:

A

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