Section 29.3: cont'd

Wednesday, January 25, 2017 1:52 PM

one last example:

let $z = y^4 \sin 6x$

find all four second partial derivatives

1st derivs)

$$\frac{\partial z}{\partial x} = 6y^4 \cos 6x \qquad \frac{\partial z}{\partial y} = 4y^3 \sin 6x$$

2nd deriv)

$$\frac{\partial^2 z}{\partial x^2} = \frac{\partial}{\partial x}(6y^4 \cos 6x) = -36y^4 \sin 6x$$

$$\frac{\partial^2 z}{\partial y^2} = \frac{\partial}{\partial y}(4y^3 \sin 6x) = 12y^2 \sin 6x$$

$$\frac{\partial^2 z}{\partial y \partial x} = \frac{\partial}{\partial y}(6y^4 \cos 6x) = 24y^3 \cos 6x$$

$$\frac{\partial^2 z}{\partial x \partial y} = \frac{\partial}{\partial x}(4y^3 \sin 6x) = 24y^3 \cos 6x$$

same!