ESERCIZI SULLE DERIVATE PARZIALI PRIME

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1 $f(x,y)=x^2-3xy-4y^2-x+2y+1$

$$\frac{\partial f(x,y)}{\partial x}=2x-3y-1$$

$$\frac{\partial f(x,y)}{\partial y}=-3x-8y+2$$

2 $f(x,y)=x^3+10xy+8y$

$$\frac{\partial f(x,y)}{\partial x}=3x^2+10y$$

$$\frac{\partial f(x,y)}{\partial y}=10x+8$$

3 $f(x,y)=\ln(x^2+y^2)$

$$\frac{\partial f(x,y)}{\partial x}=\frac{2x}{x^2+y^2}$$

$$\frac{\partial f(x,y)}{\partial y}=\frac{2y}{x^2+y^2}$$

4 $f(x,y)=3x^2-5xy+4y^2-2x+3y-2$

$$\frac{\partial f(x,y)}{\partial x}=6x-5y-2$$

$$\frac{\partial f(x,y)}{\partial y}=-5x+8y+3$$

5 $f(x,y)=x^3+4x^2y-12xy^2+2y^3$

$$\frac{\partial f(x,y)}{\partial x}=3x^2+8xy-12y^2$$

$$\frac{\partial f(x,y)}{\partial y}=4x^2-24xy+6y^2$$

6 $f(x,y)=x^6-12x^3y^2$

$$\frac{\partial f(x,y)}{\partial x}=6x^5-36x^2y^2$$

$$\frac{\partial f(x,y)}{\partial y}=-24x^3y$$

7 $f(x,y)=\frac{x-y}{x+y}$

$$\frac{\partial f(x,y)}{\partial x}=\frac{x+y-x+y}{(x+y)^2}=\frac{2y}{(x+y)^2}$$

$$\frac{\partial f(x,y)}{\partial y}=\frac{-x-y-x+y}{(x+y)^2}=-\frac{2x}{(x+y)^2}$$

8 $f(x,y)=e^{3x^2+2y^2-xy}$

$$\frac{\partial f(x,y)}{\partial x}=(6x-y)e^{3x^2+2y^2-xy}$$

$$\frac{\partial f(x,y)}{\partial y}=(4y-x)e^{3x^2+2y^2-xy}$$

9 $f(x,y)=\sqrt{x^2-y^2}$

$$\frac{\partial f(x,y)}{\partial x}=\frac{x}{\sqrt{x^2-y^2}}$$

$$\frac{\partial f(x,y)}{\partial y}=-\frac{y}{\sqrt{x^2-y^2}}$$

10 $f(x,y)=\ln(x+\ln y)$

$$\frac{\partial f(x,y)}{\partial x}=\frac{1}{x+\ln y}$$

$$\frac{\partial f(x,y)}{\partial y}=\frac{1}{y(x+\ln y)}$$

11 $f(x,y)=\sqrt{4x^2-5y}$

$$\frac{\partial f(x,y)}{\partial x}=\frac{4x}{\sqrt{4x^2-5y}}$$

$$\frac{\partial f(x,y)}{\partial y}=-\frac{5}{2\sqrt{4x^2-5y}}$$

12 $f(x,y)=xy\ln(x+y)$

$$\frac{\partial f(x,y)}{\partial x}=y\ln(x+y)+\frac{xy}{x+y}$$

$$\frac{\partial f(x,y)}{\partial y}=x\ln(x+y)+\frac{xy}{x+y}$$

13 $f(x,y)=x^3+\sqrt{2x+y}+13y$

$$\frac{\partial f(x,y)}{\partial x}=3x^2+\frac{1}{\sqrt{2x+y}}$$

$$\frac{\partial f(x,y)}{\partial y}=\frac{1}{2\sqrt{2x+y}}+13$$

14 $f(x,y)=xtgy$

$$\frac{\partial f(x,y)}{\partial x}=tgy$$

$$\frac{\partial f(x,y)}{\partial y}=\frac{x}{\cos^2 y}$$

15 $f(x,y)=\cos(x^2+y)\,16)$

$$\frac{\partial f(x,y)}{\partial x}=-2xsen\left(x^2+y\right)$$

$$\frac{\partial f(x,y)}{\partial y}=-sen\left(x^2+y\right)$$

16 $f(x,y)=y^2e^x-x^2e^y$

$$\frac{\partial f(x,y)}{\partial x}=y^2e^x-2xe^y$$

$$\frac{\partial f(x,y)}{\partial y}=2ye^x-x^2e^y$$

17 $f(x,y)=\dfrac{x^3+y^3}{x^2+y^2}$

$$\frac{\partial f(x,y)}{\partial x}=\frac{3x^2\left(x^2+y^2\right)-2x\left(x^3+y^3\right)}{\left(x^2+y^2\right)^2}=\frac{x^4+3x^2y^2-2xy^3}{\left(x^2+y^2\right)^2}$$

$$\frac{\partial f(x,y)}{\partial y}=\frac{3y^2\left(x^2+y^2\right)-2y\left(x^3+y^3\right)}{\left(x^2+y^2\right)^2}=\frac{y^4+3x^2y^2-2x^3y}{\left(x^2+y^2\right)^2}$$

18 $f(x,y)=\sqrt{4x^2-15y}$

$$\frac{\partial f(x,y)}{\partial x}=\frac{4x}{\sqrt{4x^2-15y}}$$

$$\frac{\partial f(x,y)}{\partial y}=-\frac{15}{2\sqrt{4x^2-15y}}$$

19 $f(x,y)=sen\left(\sqrt{xy}+y\right)$

$$\frac{\partial f(x,y)}{\partial x}=\cos\left(\sqrt{xy}+y\right)\cdot\frac{y}{2\sqrt{xy}}$$

$$\frac{\partial f(x,y)}{\partial y}=\cos\left(\sqrt{xy}+y\right)\cdot\left(\frac{x}{2\sqrt{xy}}+1\right)$$

20 $f(x,y)=sen\left(x^2-y^2\right)$

$$\frac{\partial f(x,y)}{\partial x}=2x\cos\left(x^2-y^2\right)$$

$$\frac{\partial f(x,y)}{\partial y}=-2y\cos\left(x^2-y^2\right)$$