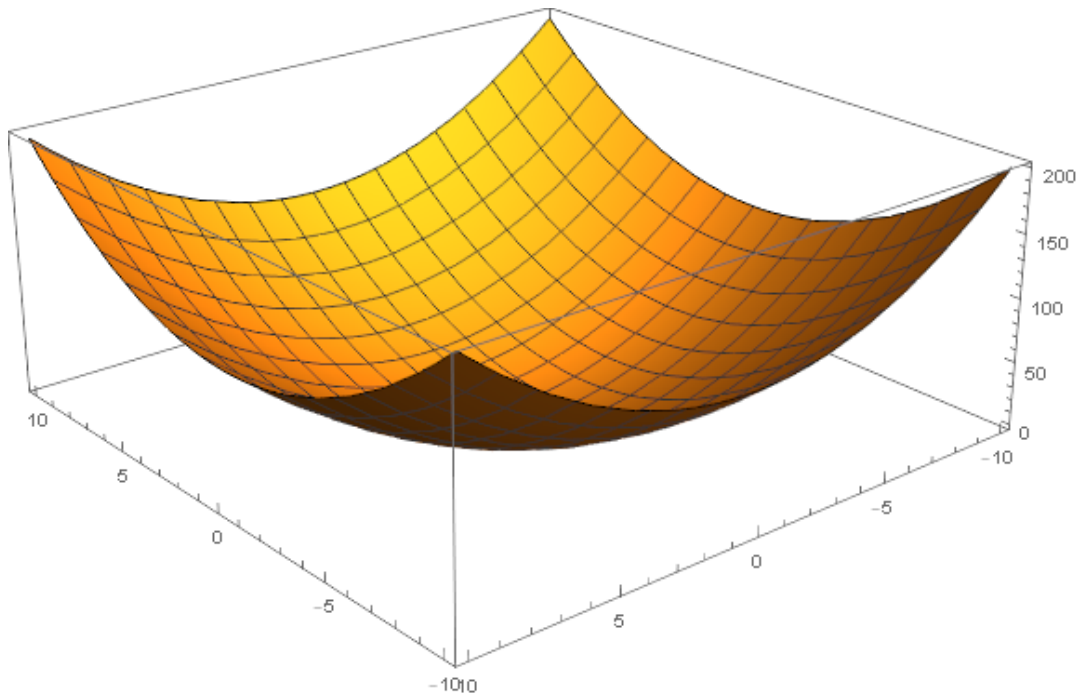


In[]:=

```
Clear[f1]
f1=Function[{x,y},x^2+y^2];
```

In[]:= Plot3D[f1[x, y], {x, -10, 10}, {y, -10, 10}, ImageSize -> Large]



In[]:= D[f1, {x, y}]

Out[]:= $\partial_{\{x,y\}}$ Function[{x, y}, x^2 + y^2]

In[]:= $\partial_{\{x,y\}}$ f1

Out[]:= $\partial_{\{x,y\}}$ Function[{x, y}, x^2 + y^2]

In[]:= $\partial_{\{x,y\}}$ f1[x, y]

Out[]:= x^{2-y} FactorialPower[2, y]

In[]:= D[f1, x]

Out[]:= Function[{x, y}, 0]

In[]:= ∂_x f1

Out[]:= Function[{x, y}, 0]

In[]:= ∂_x f1[x, y]

Out[]:= 2 x

In[]:= ∂_y f1[x, y]

Out[]:= 2 y

Derivada parcial reduz uma dimensão.

In[]:=

```
Clear[f2]
f2=Function[{a,b,c,d,e},5a^5+4b^4+3c^3+2d^2+e];
```

In[]:= f2[a, b, c, d, e]

Out[]:= $5 a^5 + 4 b^4 + 3 c^3 + 2 d^2 + e$

In[]:= $\partial_a f2[a, b, c, d, e]$

Out[]:= $25 a^4$

A derivada em uma variável é a derivada **só** da variável.

In[]:= $\partial_b f2[a, b, c, d, e]$

Out[]:= $16 b^3$

In[]:= $\partial_{a,b} f2[a, b, c, d, e]$

Out[]:= 0

In[]:= $\partial_{d,e} f2[a, b, c, d, e]$

Out[]:= 0

In[]:= $\partial_e f2[a, b, c, d, e]$

Out[]:= 1

In[]:= $\partial_{\{a,b,c,d,e\}} f2[a, b, c, d, e]$

Out[]:= $\{25 a^4, 16 b^3, 9 c^2, 4 d, 1\}$

Esta funciona parcial em mais de uma variável...

In[]:=

```
Clear[f3]
f3=Function[{x,y},  
             Sin[x y]  
             x2+y2];
```

In[]:= $\partial_{x,y} f3[x, y]$

Out[]:=
$$-\frac{2 x^2 \cos [x y]}{\left(x^2+y^2\right)^2}-\frac{2 y^2 \cos [x y]}{\left(x^2+y^2\right)^2}+\frac{\cos [x y]}{x^2+y^2}+\frac{8 x y \sin [x y]}{\left(x^2+y^2\right)^3}-\frac{x y \sin [x y]}{x^2+y^2}$$

In[]:=

```
Clear[f3b]
f3b=Function[{x,y,z},  
             Sin[x y z]  
             x2+y2+z2];
```

In[]:= $\partial_{x,y} f3b[x, y, z]$

Out[]:=
$$-\frac{2 x^2 z \cos [x y z]}{\left(x^2+y^2+z^2\right)^2}-\frac{2 y^2 z \cos [x y z]}{\left(x^2+y^2+z^2\right)^2}+\frac{z \cos [x y z]}{x^2+y^2+z^2}+\frac{8 x y \sin [x y z]}{\left(x^2+y^2+z^2\right)^3}-\frac{x y z^2 \sin [x y z]}{x^2+y^2+z^2}$$

O sinal da derivada parcial é se a variável da parcial está aumentando ou diminuindo para o valor da variável que foi fixada.¹

¹ Applied Calculus, Hallet, Gleason, Lock, Flath, 2010.