

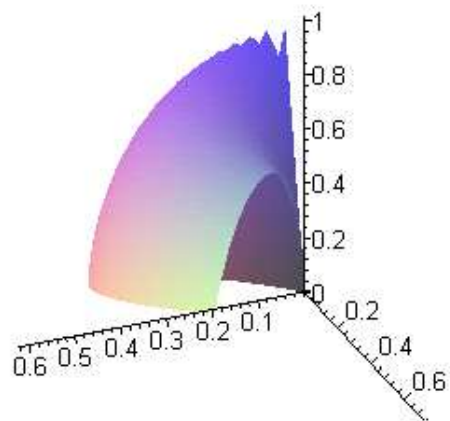
## 15.2 Funkcia viac premenných

Grafy niektorých funkcií

```
> f := 2*x*y / (x^2+y^2);
```

$$f := \frac{2xy}{x^2+y^2}$$

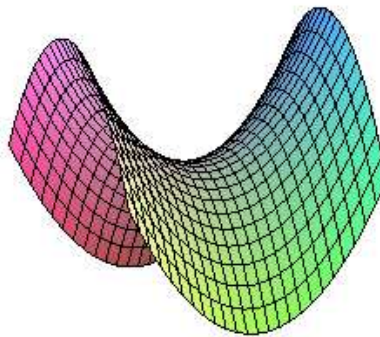
```
> plot3d(2*x*y  
/(x^2+y^2), x=0..1, y=0..1, coords=spherical, style=patch);
```



```
> f := (x-1)^2-(y-1)^2;
```

$$f := (x-1)^2 - (y-1)^2$$

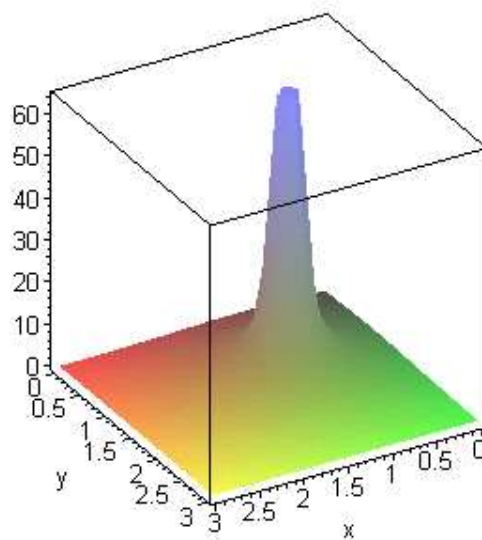
```
> plot3d((x-1)^2-(y-1)^2, x=-1..3, y=-1..3, orientation=[65,75]);
```



```
> f:= 1/((x-1)^2+(y-1)^2);
```

$$f := \frac{1}{(x-1)^2 + (y-1)^2}$$

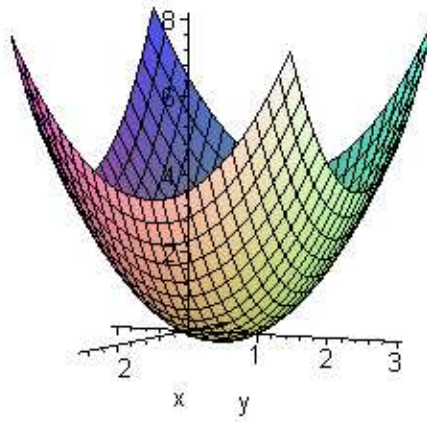
```
> plot3d(1/((x-1)^2+(y-1)^2),x=0..3,y=0..3,axes=boxed,orientation=[32,68]);
```



```
> f := (x-1)^2+(y-1)^2;
```

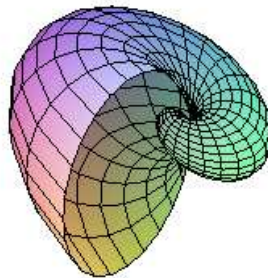
$$f := (x-1)^2 + (y-1)^2$$

```
> plot3d((x-1)^2+(y-1)^2,x=-1..3,y=-1..3,axes=normal,orientation=[27,84]);
```



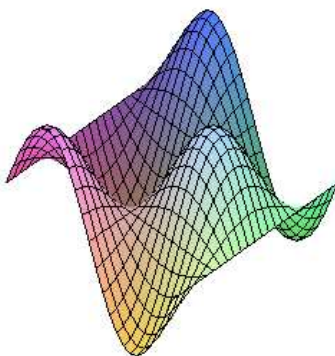
```
> f := ([1.3])^x * sin(y);
      f := [1.3]^x sin(y)
```

```
> plot3d((1.3)^x * sin(y), x=-
1..2*Pi, y=0..Pi, coords=spherical);
```



```
> f:= cos(x)*sin(y);
      f:= cos(x) sin(y)
```

```
> plot3d(cos(x)*sin(y), x=-Pi..Pi, y=-Pi..Pi);
```



Výpočet limitů a derivací

```
> Limit((x^2-y^2)/(x^2+y^2), {x=0,y=0})=limit((x^2-y^2)/(x^2+y^2), {x=0,y=0});
```

$$\text{Limit}\left(\frac{x^2-y^2}{x^2+y^2}, \{x=0, y=0\}\right) = \text{undefined}$$

```
> Limit(sin(x*y)/x, {x=0,y=1})=limit(sin(x*y)/x, {x=0,y=1});
```

$$\text{Limit}\left(\frac{\sin(xy)}{x}, \{x=0, y=1\}\right) = \text{limit}\left(\frac{\sin(xy)}{x}, \{x=0, y=1\}\right)$$

```
> Diff((x^2+3*y)*e^(2*x-y^3),x,y)=diff((x^2+3*y)*e^(2*x-y^3),x,y);
```

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

$$-6x e^{(2x - y^3)} y^2 \ln(e) + 6 e^{(2x - y^3)} \ln(e) - 6(x^2 + 3y) e^{(2x - y^3)} y^2 \ln(e)^2$$

Implicitné funkcie (dy/dx , ak funkcia y(x) je zadaná implicitne pomocou funkcie f:

```
> f := x^2+y^3=1;
```

$$f := x^2 + y^3 = 1$$

```
> Implicitdiff(f,y(x),x)=implicitdiff(f,y(x),x);
```

$$\text{Implicitdiff}(x^2 + y^3 = 1, y(x), x) = -\frac{2}{3} \frac{x}{y^2}$$

```
> implicitdiff(f,x(y),y);
```

$$-\frac{3}{2} \frac{y^2}{x}$$

```
> implicitdiff(f,y,z);
```

$$0$$

## Grafy - animácie

```
> with(plots):  
animate3d(cos(t*x)*sin(t*y),x=-Pi..Pi, y=-Pi..Pi,t=1..2);
```

