

Implicitní funkce jedné promnných
Soubor: Impl_predn_2018

```
> restart;  
> with(plots):
```

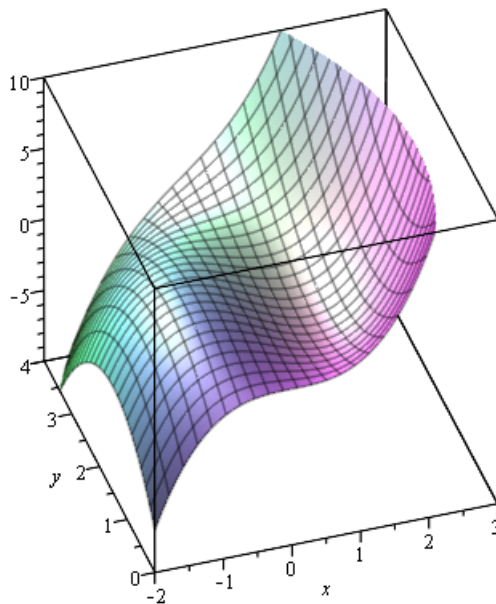
Pr 1: Graf funkce $z=F(x,y)$

```
> F:=x^3+x*y^2-3*x*y+1;
```

$$F:=x^3 + xy^2 - 3xy + 1$$

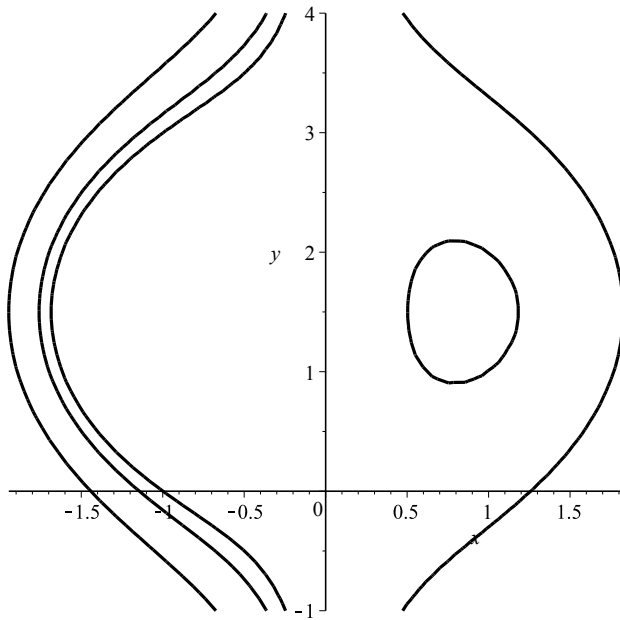
(1)

```
> plot3d(F,x=-2..3,y=0..4,view=-10..10,axes=boxed,orientation=  
[-108,52]);
```



Izokrivky (vrstevnice) $F(x,y)=k$ pro $k=-2, -0.5, 0, 0.5, 1, 3$

```
> contourplot(x^3 + x*y^2 - 3*x*y + 1,x=-2..3,y=-1..4, grid = [50, 50], thickness = 2,  
color = "black", contours = [-2, -0.5, 0, 3])
```



Pr.1. Krivka, tecna, Taylorv polynom - grafy v okolí bodu A=[1,2]

> $x^3 + x*y^2 - 3*x*y + 1 = 0$; $y = 2 - (x - 1)$; $T2(x) = 2 - (x - 1) - 3*(x - 1)^2$;

$$x^3 + x*y^2 - 3*x*y + 1 = 0$$

$$y = 3 - x$$

$$T2(x) = 3 - x - 3(x - 1)^2$$

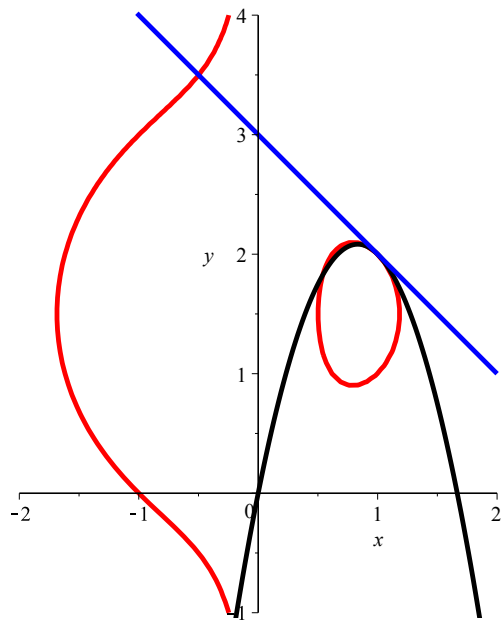
(2)

> `p1:=implicitplot(x^3+x*y^2-3*x*y+1 = 0,x=-2..2,y=-1..4, scaling=constrained,numpoints=3000,color = "red",thickness=3):`

> `p2:=plot(3-x,x=-2..2,y=-1..4,scaling=constrained, color=[blue],thickness=3):`

> `p3:=plot(3-x-3*(x-1)^2,x=-2..2,y=-1..4,scaling=constrained, color=[black],thickness=3):`

> `plots[display]({p1,p2,p3});`



Pr.2. Krivka, tečna, Taylorv polynom - grafy v okolí bodu A=[2,0]

```
> x^3 - sin(y) + y^4 - 8 = 0; y = 12 * x - 24; Ta[2](x) = 12 * x - 24 + 6 * (x - 2)^2;
```

$$x^3 - \sin(y) + y^4 - 8 = 0$$

$$y = 12x - 24$$

$$Ta_2(x) = 12x - 24 + 6(x - 2)^2$$

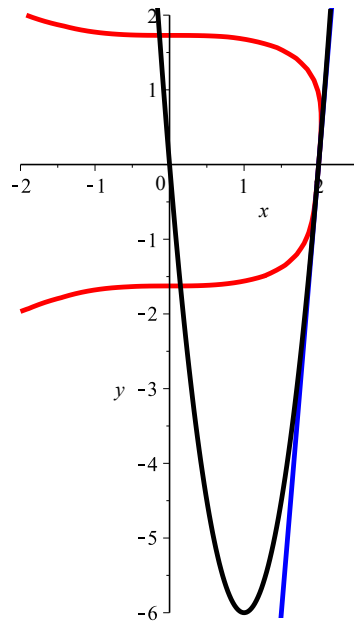
(3)

```
> r3:=implicitplot(x^3-sin(y)+y^4=8,x=-2..2.5,y=-6..2,color =
"red",
scaling=constrained,numpoints=3000,thickness=3):
```

```
> r4:=plot(12*x-24,x=-2..2.5,y=-6..2,scaling=constrained,
color=[blue],thickness=3):
```

```
> r5:=plot(12*x-24+6*(x-2)^2,x=-2..2.5,y=-6..2,scaling=constrained,
color=[black],thickness=3):
```

```
> plots[display]({r3,r4,r5});
```



Pr 183 Sb. Krivka a její graf v okolí bodu A=[2,-1]

```
> x^3+y^4+2*x^2*y-1=0;y=-1-(x-2);T2(x)=-1-(x-2)-0.5*(x-2)^2;
```

$$x^3 + y^4 + 2x^2y - 1 = 0$$

$$y = -x + 1$$

$$T2(x) = 1 - x - 0.5(x - 2)^2$$

(4)

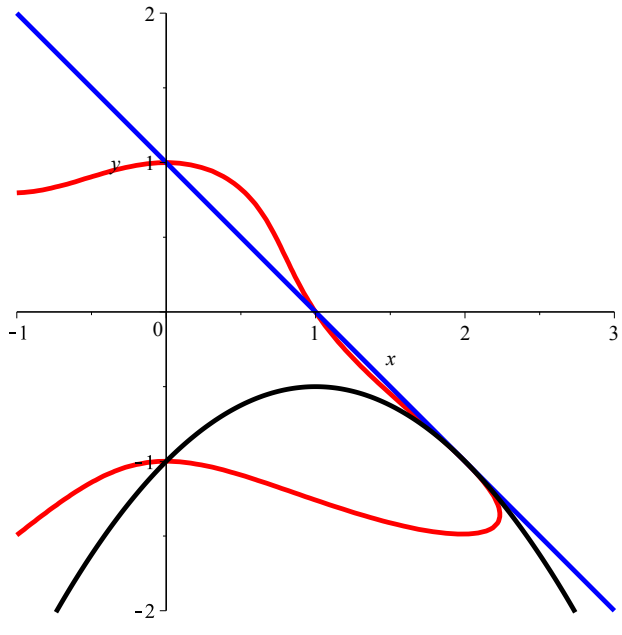
```
> q1:=implicitplot(x^3+y^4+2*x^2*y-1=0,x=-1..3,y=-2..1,color =
"red",
```

```
scaling=constrained,numpoints=3000,thickness=3):
```

```
> q2:=plot(1-x,x=-1..3,y=-2..2,scaling=constrained,
color=[blue],thickness=3):
```

```
> q3:=plot(1-x-0.5*(x-2)^2,x=-1..3,y=-2..1,scaling=constrained,
color=[black],thickness=3):
```

```
> plots[display]({q1,q2,q3});
```



v