

1.4 Asymptotické směry

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[ > restart;
[ > with(LinearAlgebra):
[ > X:=Vector[row]([x,y,z,1]);
                                X := [x, y, z, 1]
[ > K:=Matrix(a,1..4,1..4,shape=symmetric);
                                K :=  $\begin{bmatrix} a(1,1) & a(1,2) & a(1,3) & a(1,4) \\ a(1,2) & a(2,2) & a(2,3) & a(2,4) \\ a(1,3) & a(2,3) & a(3,3) & a(3,4) \\ a(1,4) & a(2,4) & a(3,4) & a(4,4) \end{bmatrix}$ 
[ > Kv:=expand(X.K.Transpose(X))=0;
Kv :=  $x^2 a(1,1) + 2xy a(1,2) + 2xz a(1,3) + 2x a(1,4) + y^2 a(2,2) + 2yz a(2,3) + 2y a(2,4) + z^2 a(3,3) + 2z a(3,4) + a(4,4) = 0$ 
[ > M:=[m,n,p];
                                M := [m, n, p]
[ > Primka:=[x=m+t*u,y=n+t*v,z=p+t*w];
                                Primka := [x = m + t u, y = n + t v, z = p + t w]
[ > Kv1:=simplify(eval(Kv,Primka));
Kv1 :=  $2 a(3,4) t w + 2 a(1,1) m t u + 2 a(1,2) m t v + 2 a(1,2) t u n + 2 a(1,2) t^2 u v + 2 a(1,3) m t w + 2 a(1,3) t u p + 2 a(1,3) t^2 u w + 2 a(2,2) n t v + 2 a(2,3) n t w + 2 a(2,3) t v p + 2 a(2,3) t^2 v w + 2 a(3,3) p t w + a(1,1) t^2 u^2 + 2 a(1,2) m n + 2 a(1,3) m p + 2 a(1,4) t u + a(2,2) t^2 v^2 + 2 a(2,3) n p + 2 a(2,4) t v + a(3,3) t^2 w^2 + a(4,4) + a(3,3) p^2 + 2 a(3,4) p + a(1,1) m^2 + 2 a(1,4) m + a(2,2) n^2 + 2 a(2,4) n = 0$ 
[ > A:=coeff(lhs(Kv1),t^2);
                                A :=  $2 a(1,2) u v + 2 a(1,3) u w + 2 a(2,3) v w + a(1,1) u^2 + a(2,2) v^2 + a(3,3) w^2$ 

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Příklad:

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[ > a(1,1):=1: a(2,2):=1: a(3,3):=0: a(4,4):=-1: a(1,2):=0:
a(1,3):=0: a(1,4):=0: a(2,3):=0: a(2,4):=0: a(3,4):=0:
[ > Kv;
                                 $x^2 - 1 + y^2 = 0$ 
[ > RovAsSm:=A=0;
                                RovAsSm :=  $u^2 + v^2 = 0$ 
[ > Res:=solve(RovAsSm,{u,v});
                                Res := {u = v I, v = v}, {u = -I v, v = v}
[ > u:=Vector[row]([0,0,1]);
                                u := [0, 0, 1]
[ > plotsetup(inline,plotoptions=`portrait,noborder,shrinkby=0`);
[ > Valec:=plots[implicitplot3d](Kv,x=-1..1,y=-1..1,z=-1..2,axes=frame,color=COLOR(
RGB,205/255,205/255,205/255),style=patchcontour,g

```

```
rid=[20,20,20],light=[90,-5,1,1,1],tickmarks=[3,3,3],orientation
=[52,63],scaling=constrained):
> AsSmer:= plottools[arrow](vector([0, 0, 1]), 2.3*u, .1, .2, .1,
cylindrical_arrow):
> plots[display](Valec,AsSmer,
view=[-1.5..1.5,-1.5..1.5,0..3.5],color=red, orientation=[52,
63]);
```

