

Geometrie computationala - laboratorul 8 - 07/04/2016

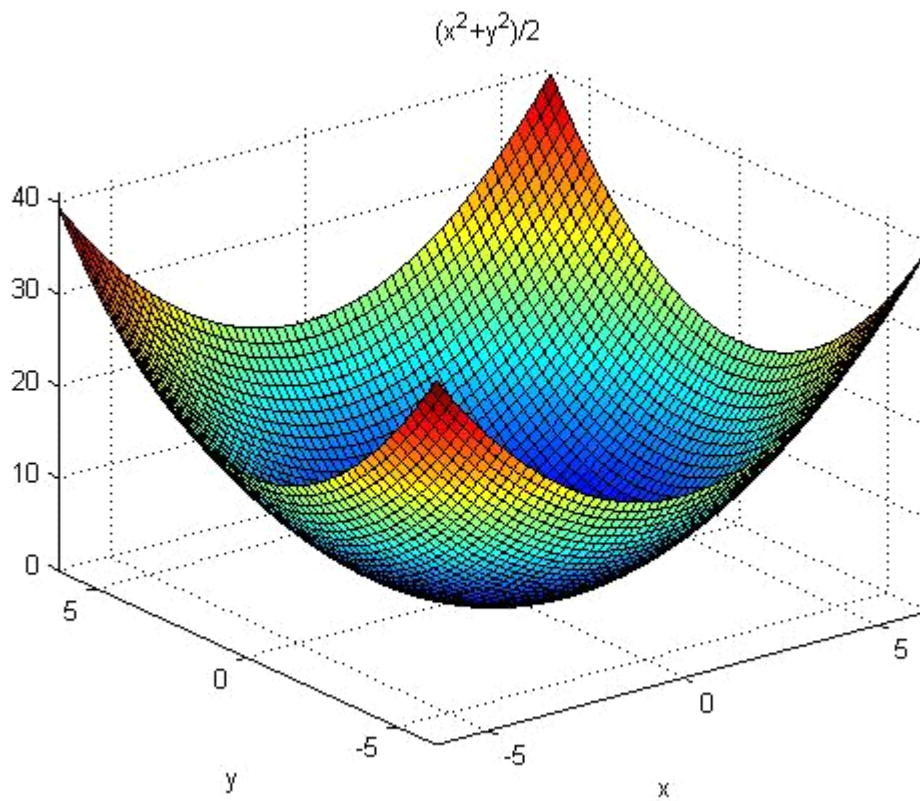
1) Reprezentati grafic urmatoarele suprafete.

```
% paraboloidul de rotatie
```

```
clear all;  
x=-2*pi:0.01:2*pi;  
y=-2*pi:0.01:2*pi;
```

```
% ec. explicita
```

```
a) ezsurf('(x^2+y^2)/2');
```



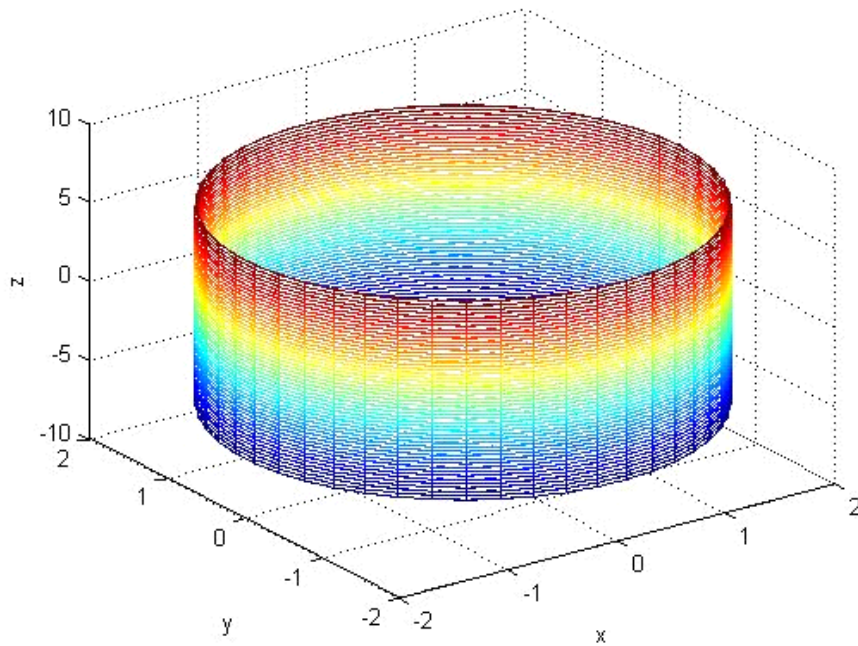
```
% ec parametrice
```

```
b) ezmesh('u+v', 'u-v', 'u^2+v^2');
```

```
% aceeaasi figura
```

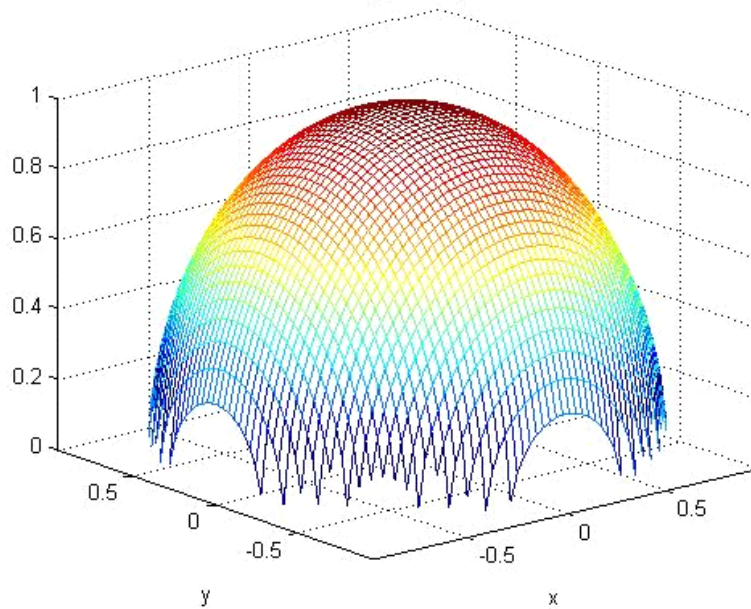
```
% cilindrul circular drept  
c) ezmesh('2*cos(u)', '2*sin(u)', 'v');
```

$$x = 2 \cos(u), y = 2 \sin(u), z = v$$



```
% sfera  
d) ezmesh('sqrt(1-x^2-y^2)');
```

$$\sqrt{1-x^2-y^2}$$



```
% fereastra lui Viviani: curba care se obtine prin intersectia unei sfere de raza R cu un cilindru de diametru R (tangent la sfera si care trece prin centrul sferei)
```

```
e)
```

```
clear all;
```

```
u=-pi/2:pi/25:pi/2;
```

```
v=0:pi/10:pi*2;
```

```
m=length(u);
```

```
n=length(v);
```

```
r=2;
```

```
for i=1:m
```

```
    for j= 1:n
```

```
        x(i,j)=r*cos(u(i))*cos(v(j));
```

```
        y(i,j)=r*cos(u(i))*sin(v(j));
```

```
        z(i,j)=r*sin(u(i))+0*j;
```

```
    end
```

```
end
```

```
mesh(x,y,z);
```

```
clear
```

```
hold on
```

```
u=0:pi/10:2*pi;
```

```
m=length(u);
```

```
v=-2.1:0.01:2.1;
```

```
n=length(v);
```

```
for i=1:m
```

```
    for j= 1:n
```

```
        x(i,j)=cos(u(i))+0*j;
```

```
        y1(i,j)=1+sin(u(i))+0*j;
```

```
        y2(i,j)=-1+sin(u(i))+0*j;
```

```
        z(i,j)=0*i+v(j);
```

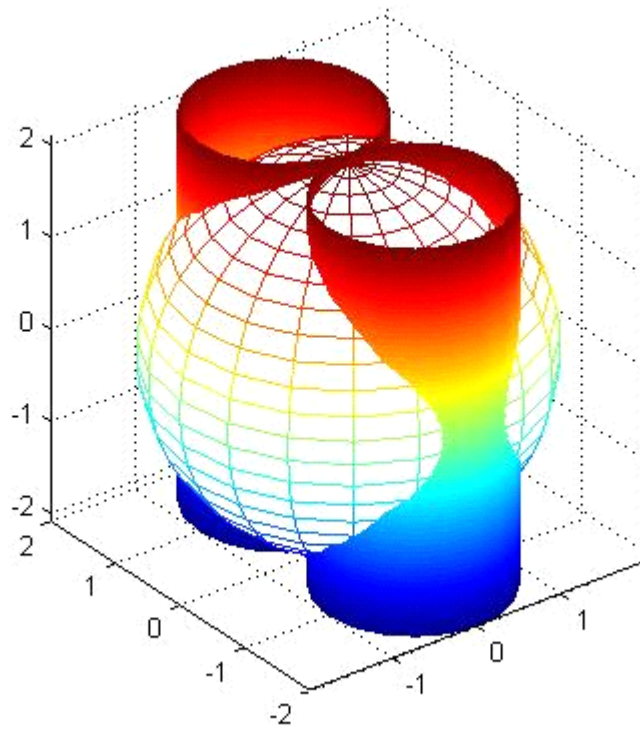
```
    end
```

```
end
```

```
mesh(x,y1,z)
```

```
mesh(x,y2,z)
```

```
axis equal
```



```
% diverse curbe pe sfera
```

```
f)
```

```
clear all;
```

```
u=-pi/2:pi/25:pi/2;
```

```
v=0:pi/10:pi*2;
```

```
m=length(u);
```

```
n=length(v);
```

```
r=2;
```

```
for i=1:m
```

```
    for j= 1:n
```

```
        x(i,j)=r*cos(u(i))*cos(v(j));
```

```
        y(i,j)=r*cos(u(i))*sin(v(j));
```

```
        z(i,j)=r*sin(u(i))+0*j;
```

```
    end
```

```
end
```

```
mesh(x,y,z);
```

```
hold on
```

```
%ecuatorul
```

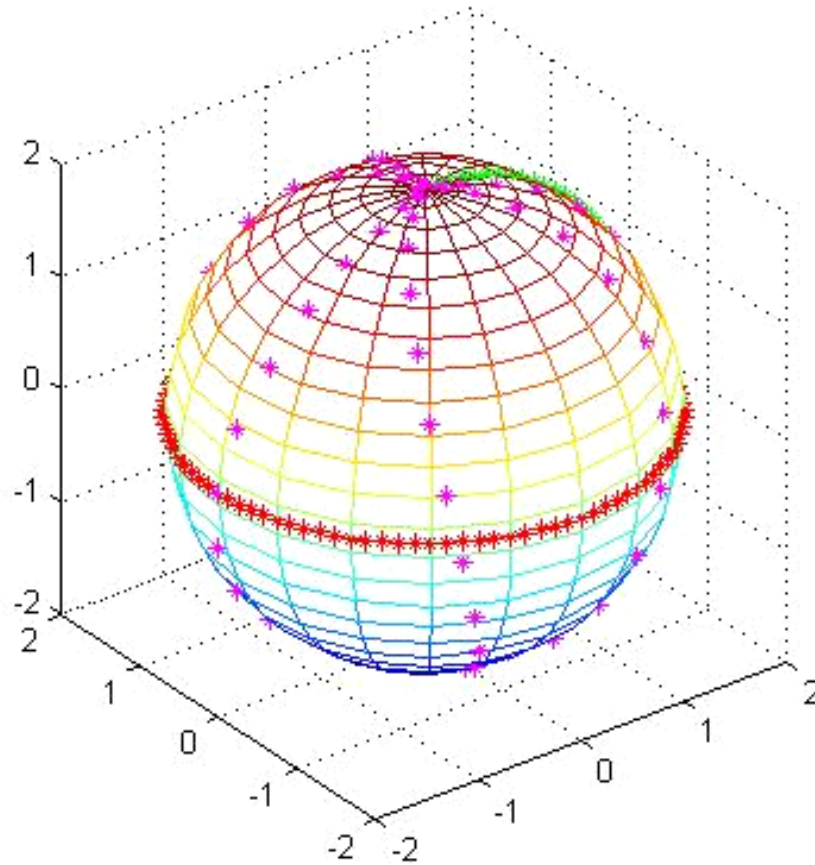
```
t= 0:pi/50:2*pi;
```

```
u=0*t;
```

```

v=t;
x=r*cos(u).*cos(v);
y=r*cos(u).*sin(v);
z=r*sin(u);
plot3(x,y,z,'*r');

```



```

%meridianul 0
t=-pi/2:pi/50:pi/2;
u=t;
v=0*t;
x=r*cos(u).*cos(v);
y=r*cos(u).*sin(v);
z=r*sin(u);
plot3(x,y,z,'*g');

t=0:pi/50:2*pi;
v=t;
u=-pi/2*sin(3*t);
x=r*cos(u).*cos(v);
y=r*cos(u).*sin(v);

```

```
z=r*sin(u);  
plot3(x,y,z,'*m');  
  
axis equal
```

