GEODESIC FOR A SPHERICAL SURFACE

(SINGLE PATH)

SOURCE CODE:

//xarc(-1,1,2,2,0,60\*64)

//xarc(-1.5,1.5,3,3,0,360\*64)

//e=gce()

//e.visible='on'

//e.visible='on'

//plot2d(0,0,-1,"031"," ",[-2,-2,2,2])

//Part1;-

r1=[1 2 2]

r2=[1 5 9]

n1=norm(r1)

disp(n1,"Norm 1:")

n2=norm(r2)

disp(n2,"Norm 2:")

k=(r1\*r2')/(n1\*n2)

ang=acosd(k)

disp(ang,"Angle in degrees:")

j=acos(k)

disp(j,"Angle in radians:")

th=linspace(0,ang,100)

x=cosd(th)

y=sind(th)

z=zeros(100,1)

subplot(2,2,1)

a=get("current\_axes")

a.thickness=2

param3d1(x,y,z)

title("Arc between two vectors","fontsize",3)

//Part2:-

ph1=linspace(0,2\*%pi,60)

th=acot(cos(ph1))

x=n1.\*sin(th).\*cos(ph1)

y=n1.\*sin(th).\*sin(ph1)

z=n1.\*cos(th)

subplot(2,2,2)

a=get("current\_axes")

a.thickness=2

param3d1(x,y,z)

title("Geodesic circle for one path","fontsize",3)

//Part3:-

ph1=linspace(0,2\*%pi,60)

th=linspace(0,2\*%pi,60)

[theta1,ph1]=meshgrid(th,ph1)

x=n1.\*sin(theta1).\*cos(ph1)

y=n1.\*sin(theta1).\*sin(ph1)

z=n1.\*cos(theta1)

subplot(2,2,3)

a=get("current\_axes")

a.thickness=2

surf(x,y,z,"facecol","red")

th=acot(cos(ph1))

x=n1.\*sin(th).\*cos(ph1)

y=n1.\*sin(th).\*sin(ph1)

z=n1.\*cos(th)

param3d1(x,y,z)

title("Geodesic on sphere-- acos(phi-phi0)=cot(theta)","fontsize",3)

OUTPUT:

Norm 1:

3.

Norm 2:

10.34408

Angle in degrees:

20.850562

Angle in radians:

0.363911

