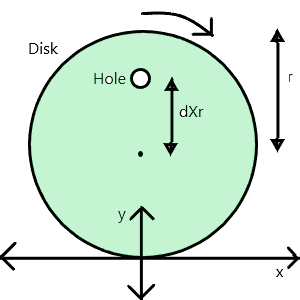
# mieke willems: spirograph

# Introduction to spirograph simulation in MATLAB

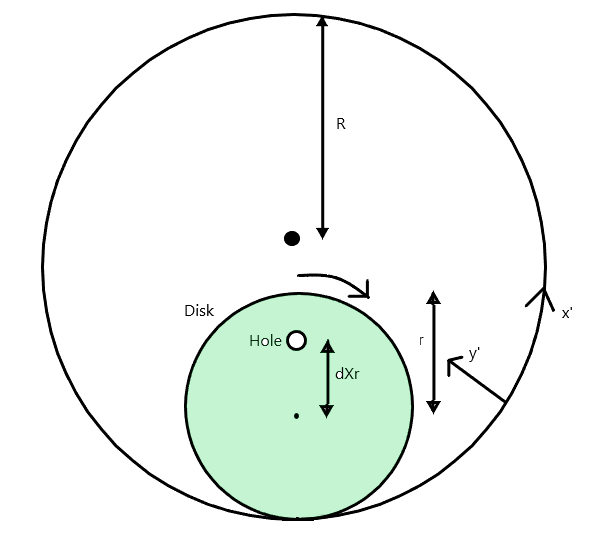
# Muhammad Shamaas

# ID # MC220204248



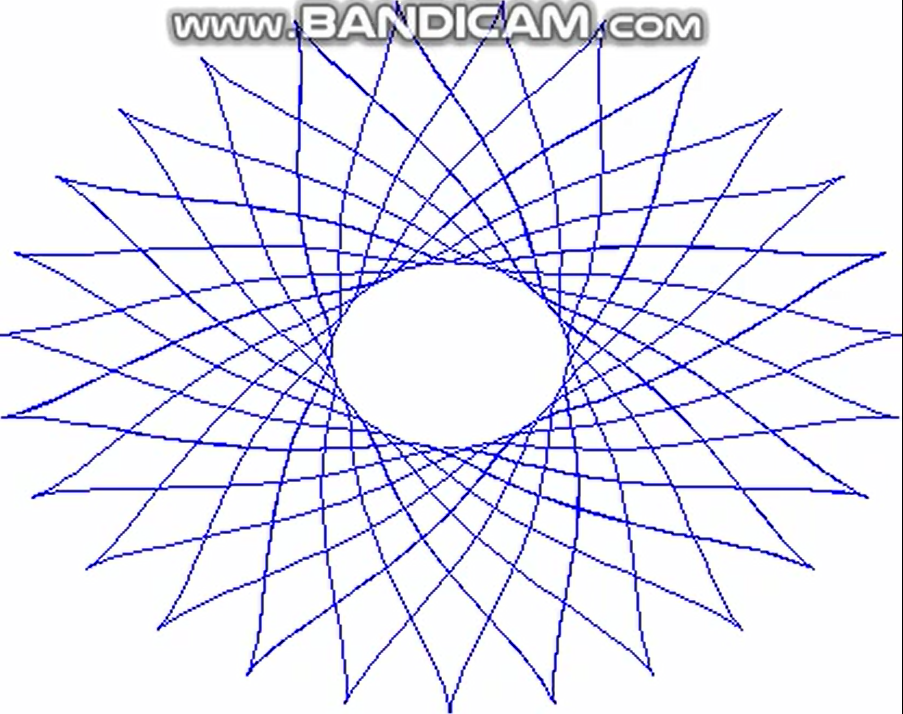
The hole is dr from the center of disk. Where r is the radius of disk.

If the disk rotates by Ɵ radians, the new coordinates of the hole will be:



If the disk rotates inside a bigger disk of radius R, the axes must be transformed:

Results



MATLAB Code:

r=10;

f=0.0001;

dis = 0.6;

coordinates = [0,(1+dis)\*r];

newcoordinates = [0,(1+dis)\*r];

Ccoordinates = [0,(1+dis)\*r];

Ccoordinatesnew = [0,(1+dis)\*r];

c = [0 r/2];

R = 20;

for R=20:30

for dis=0.2:0.2:1

figure;

axis([-R-1,R+1,-1,2\*R+1])

hold on;

for t=0:1440

newcoordinates(1) = r\*(t/(2\*pi)) + (dis\*r)\*sin(t/(2\*pi));

newcoordinates(2) = r+(dis\*r)\*cos(t/(2\*pi));

coordinates = newcoordinates;

theta = newcoordinates(1)/(R);

Ccoordinatesnew(1) = R\*sin(theta)-newcoordinates(2)\*sin(theta);

Ccoordinatesnew(2) = R-R\*cos(theta)+newcoordinates(2)\*cos(theta);

if (t~=0)

plot([Ccoordinates(1),Ccoordinatesnew(1)],[Ccoordinates(2),Ccoordinatesnew(2)]);

end

Ccoordinates = Ccoordinatesnew;

end

end

end