**HOMEWORKS 3**

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**Bài 1: Vẽ trái tim**

syms l1 l2 l3 t t1 t2 c1 s1 c2 s2

l1 = 25;

l2 = 20;

for t=-pi:0.05:pi

X = 16\*(sin(t)^3);

Y = 13\*cos(t) - 5\*cos(2\*t) - 2\*cos(3\*t) - cos(4\*t);

c2 = (X^2 + Y^2 - l1^2 - l2^2)/(2\*l1\*l2);

s2 = sqrt(abs(1-c2^2));

t2 = atan2(s2,c2);

c1 = X\*(l1+l2\*c2) + Y\*l2\*s2;

s1 = Y\*(l1 + l2\*c2) - X\*l2\*s2;

t1 = atan2(s1,c1);

Px = l1\*cos(t1) + l2\*cos(t1+t2);

Py = l1\*sin(t1) + l2\*sin(t1+t2);

%ve trai tim

subplot(2,1,1);

plot(t,t2\*180/pi,'\*');

pause(0.1);

xlabel('t'); ylabel('rotation')

hold on

subplot(2,1,2);

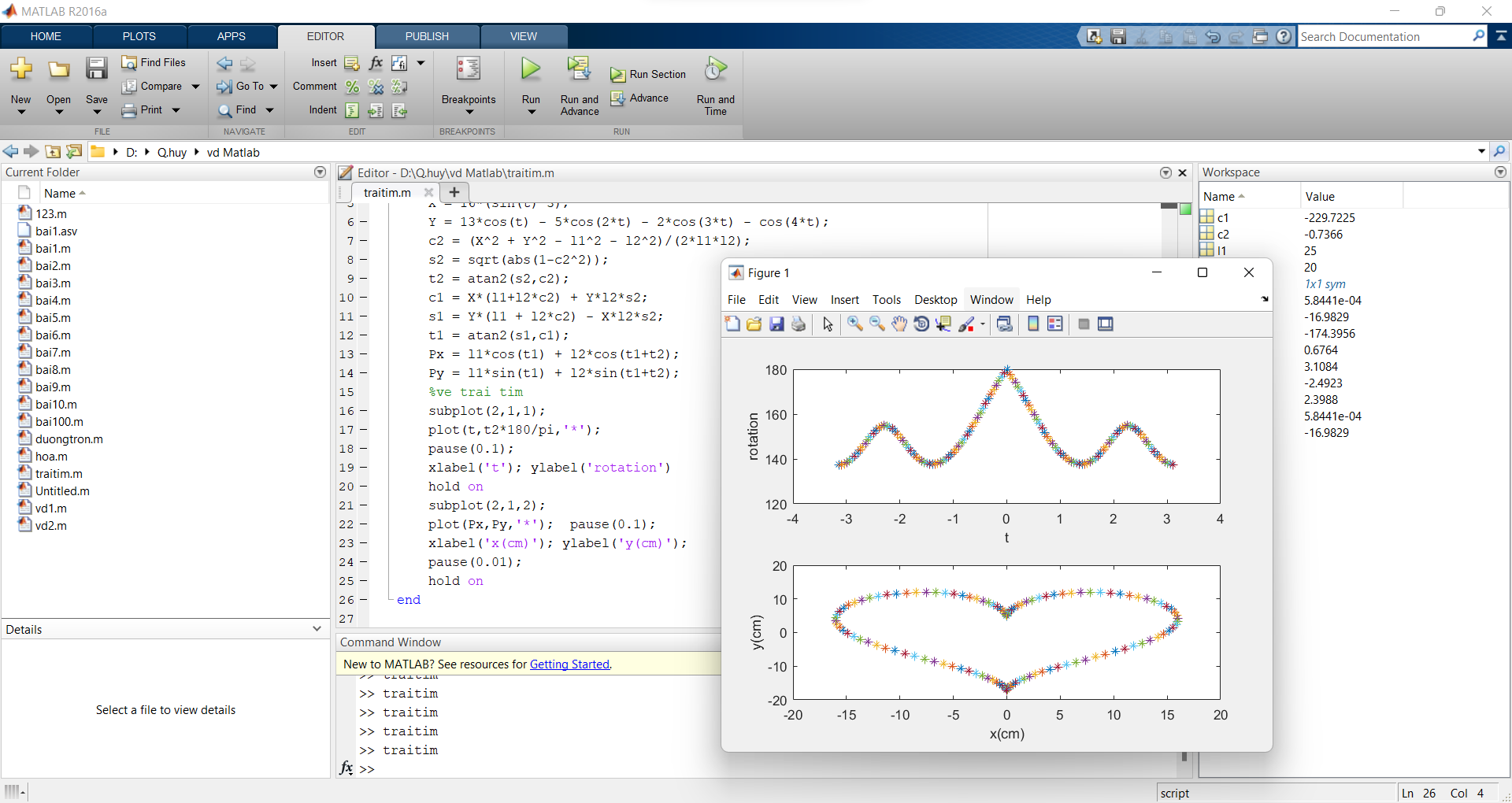
plot(Px,Py,'\*'); pause(0.1);

xlabel('x(cm)'); ylabel('y(cm)');

pause(0.01);

hold on

end



**Bài 2: Vẽ con bướm**

syms l1 l2 l3 t t1 t2 c1 s1 c2 s2 e

l1 = 10;

l2 = 10;

for t=0:0.05:2\*pi

X = sin(t)\*(exp(cos(t)) - 2\*cos(4\*t) - sin(t/12)^5);

Y = cos(t)\*(exp(cos(t)) - 2\*cos(4\*t) - sin(t/12)^5);

c2 = (X^2 + Y^2 - l1^2 - l2^2)/(2\*l1\*l2);

s2 = sqrt(abs(1-c2^2));

t2 = atan2(s2,c2);

c1 = X\*(l1+l2\*c2) + Y\*l2\*s2;

s1 = Y\*(l1 + l2\*c2) - X\*l2\*s2;

t1 = atan2(s1,c1);

Px = l1\*cos(t1) + l2\*cos(t1+t2);

Py = l1\*sin(t1) + l2\*sin(t1+t2);

%ve buom

subplot(2,1,1);

plot(t,t2\*180/pi,'\*');

pause(0.1);

xlabel('t'); ylabel('rotation')

hold on

subplot(2,1,2);

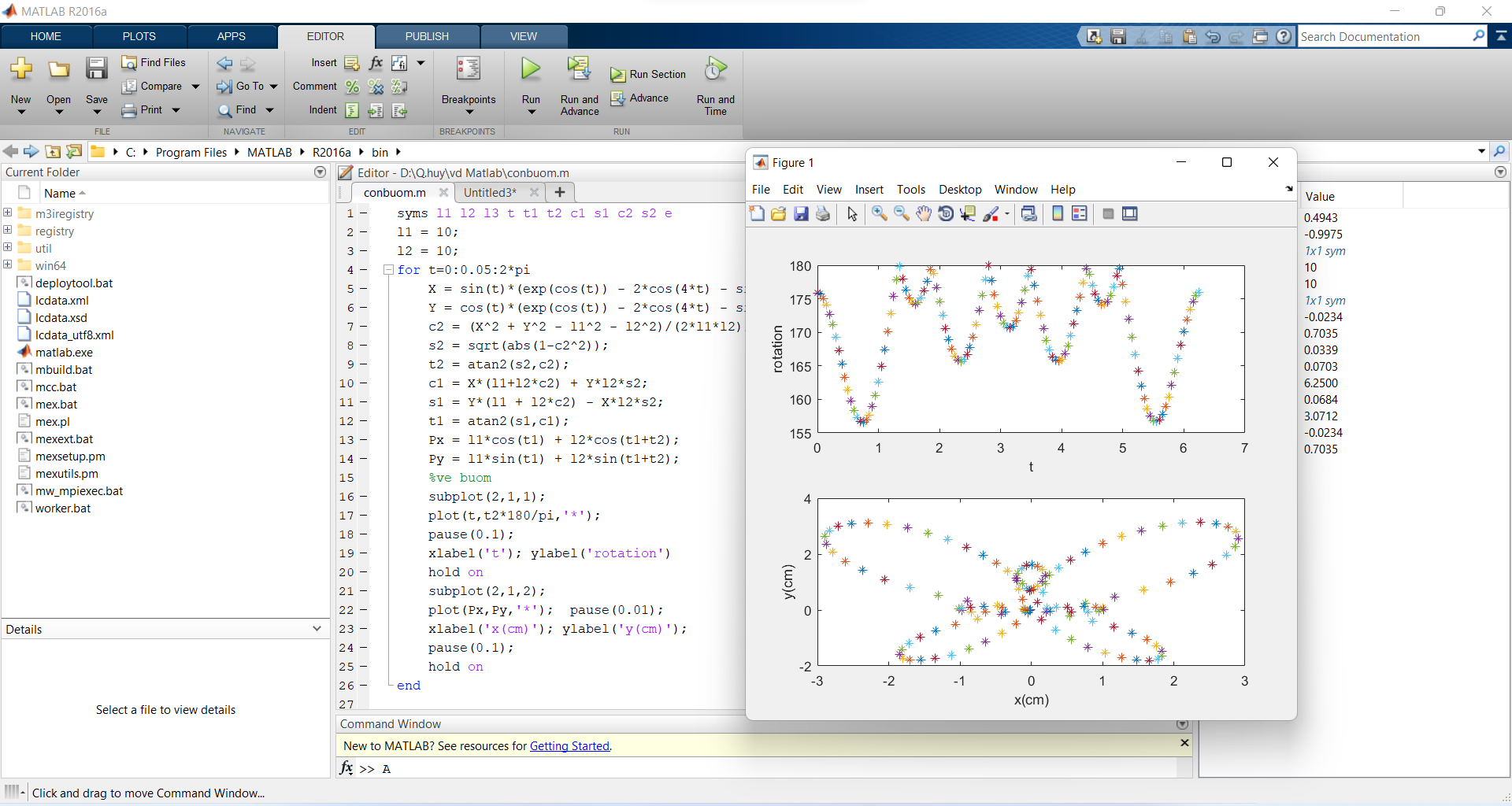
plot(Px,Py,'\*'); pause(0.01);

xlabel('x(cm)'); ylabel('y(cm)');

pause(0.1);

hold on

end



**Bài 3: Hoa sáu cánh**

syms l1 l2 l3 t t1 t2 c1 s1 c2 s2 e

l1 = 10;

l2 = 10;

for t=0:0.01:2\*pi

X = (1+cos(6\*t))\*cos(t);

Y = (1+cos(6\*t))\*sin(t);

c2 = (X^2 + Y^2 - l1^2 - l2^2)/(2\*l1\*l2);

s2 = sqrt(abs(1-c2^2));

t2 = atan2(s2,c2);

c1 = X\*(l1+l2\*c2) + Y\*l2\*s2;

s1 = Y\*(l1 + l2\*c2) - X\*l2\*s2;

t1 = atan2(s1,c1);

Px = l1\*cos(t1) + l2\*cos(t1+t2);

Py = l1\*sin(t1) + l2\*sin(t1+t2);

%ve hoa sau canh

subplot(2,1,1);

plot(t,t2\*180/pi,'\*');

pause(0.1);

xlabel('t'); ylabel('rotation')

hold on

subplot(2,1,2);

plot(Px,Py,'\*'); pause(0.01);

xlabel('x(cm)'); ylabel('y(cm)');

pause(0.1);

hold on

end

