Rotating curves described by parametric equations

We will rotate the curve C: x=Sin[7t], y=5Cos[t] around the origin thru an angle of aa radians.

First define the functions and plot the curve C itself...

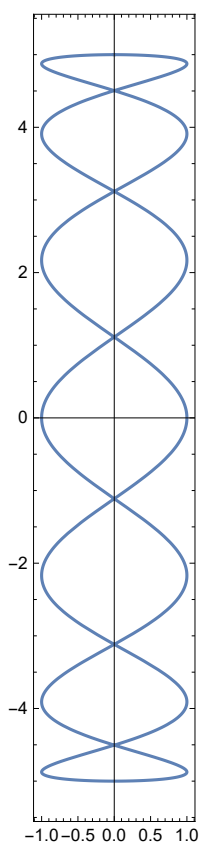
In[1]:=
```
x[t_] = Sin[7 t]
y[t_] = 5 Cos[t]
```

Out[1]= Sin[7 t]

Out[2]= 5 Cos[t]

In[3]:=
```
ParametricPlot[{x[t], y[t]}, {t, 0, 2 Pi}, Axes → True, Frame → True]
```

Out[3]=

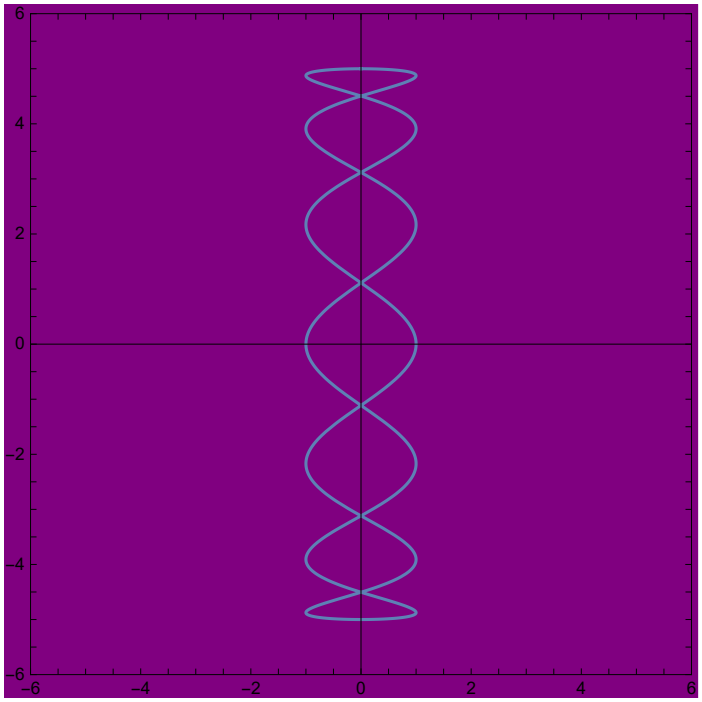


When we rotate we will want to have a square viewing centered at the origin, and the output suggests the viewing window [-6,6]x[-6,6]
will be appropriate to show all of the rotated graphs. Use the PlotRange command to set

this window...

In[4]:=
```
ParametricPlot[{x[t], y[t]}, {t, 0, 2 Pi},
 PlotRange → {{-6, 6}, {-6, 6}}, Axes → True, Frame → True, Background → Purple]
```

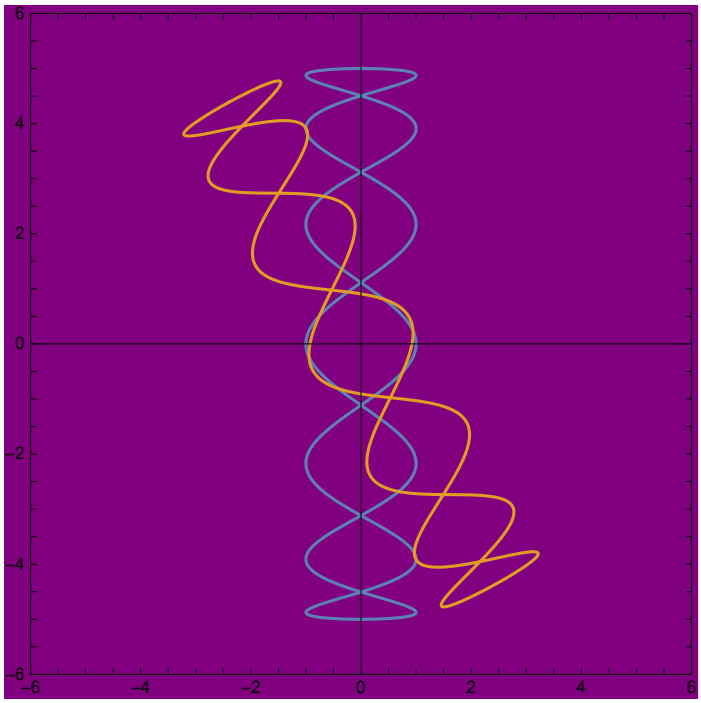
Out[4]=



Now we'll show the curve C and the curve obtained by from by rotating by aa=.5 radians ...

In[5]:=
```
aa = .5;
ParametricPlot[
 {{x[t], y[t]}, {x[t] * Cos[aa] - y[t] * Sin[aa], x[t] * Sin[aa] + y[t] * Cos[aa]}},
 {t, 0, 2 Pi}, Axes → True, Frame → True,
 PlotRange → {{-6, 6}, {-6, 6}}, Background -> Purple]
```

Out[6]=



From this we can easily allow the angle aa to vary from 0 to 2Pi
and use Manipulate to animate the rotation of C all the way around...

In[7]:=
```
Manipulate[ParametricPlot[
  {{x[t], y[t]}, {x[t] * Cos[aa] - y[t] * Sin[aa], x[t] * Sin[aa] + y[t] * Cos[aa]}},
  {t, 0, 2 Pi}, Axes → True, Frame → True,
  PlotRange → {{-6, 6}, {-6, 6}}, Background → Purple], {aa, 0, 2 Pi}]
```

Out[7]=