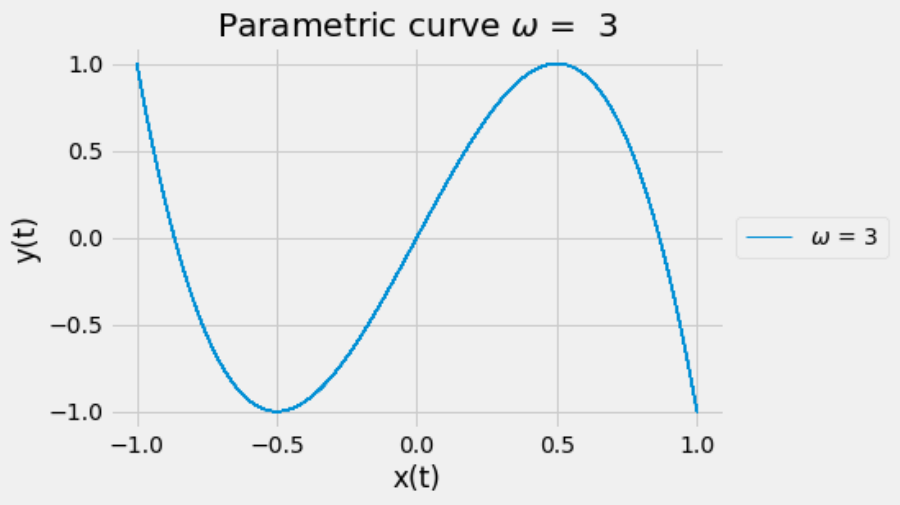
Parametric Curves

In [1]:
```
# Importing numpy and matplotlib
import numpy as np
import matplotlib.pyplot as plt
```

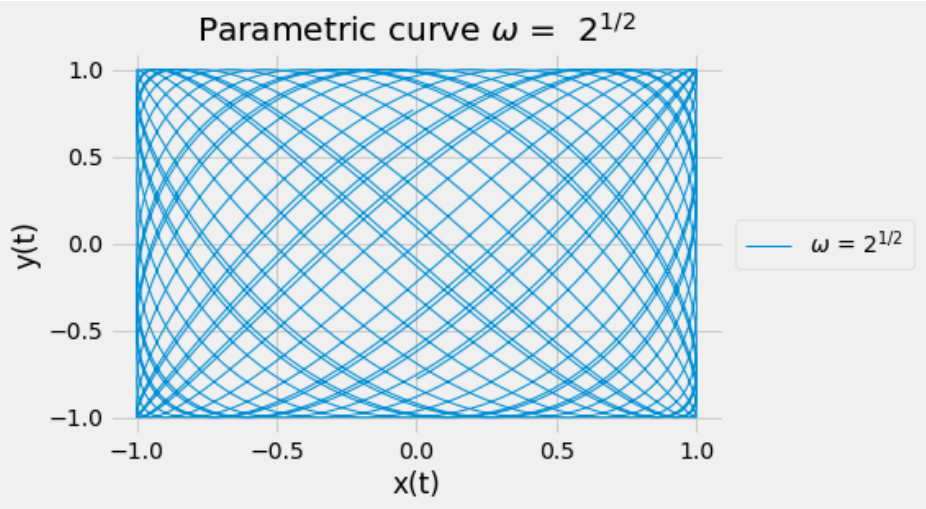
In [2]:
```
plt.style.use('fivethirtyeight')
```

In [3]:
```
# Call data files from Fortran
filenamea = 'parametric_curves_a.dat'
filenameb = 'parametric_curves_b.dat'
filenamec = 'parametric_curves_c.dat'
filenamed = 'parametric_curves_d.dat'
filenamee = 'parametric_curves_e.dat'
filenamef = 'parametric_curves_f.dat'


all_dataa = np.loadtxt(filenamea,skiprows=0)
all_datab = np.loadtxt(filenameb,skiprows=0)
all_datac = np.loadtxt(filenamec,skiprows=0)
all_datad = np.loadtxt(filenamed,skiprows=0)
all_datae = np.loadtxt(filenamee,skiprows=0)
all_dataf = np.loadtxt(filenamef,skiprows=0)

# We transpose the array in order to be able to extract each column individ
ually
all_dataa = all_dataa.transpose()
all_datab = all_datab.transpose()
all_datac = all_datac.transpose()
all_datad = all_datad.transpose()
all_datae = all_datae.transpose()
all_dataf = all_dataf.transpose()


xa = all_dataa[0]
ya = all_dataa[1]

xb = all_datab[0]
yb = all_datab[1]

xc = all_datac[0]
yc = all_datac[1]

xd = all_datad[0]
yd = all_datad[1]

xe = all_datae[0]
ye = all_datae[1]

xf = all_dataf[0]
yf = all_dataf[1]
```

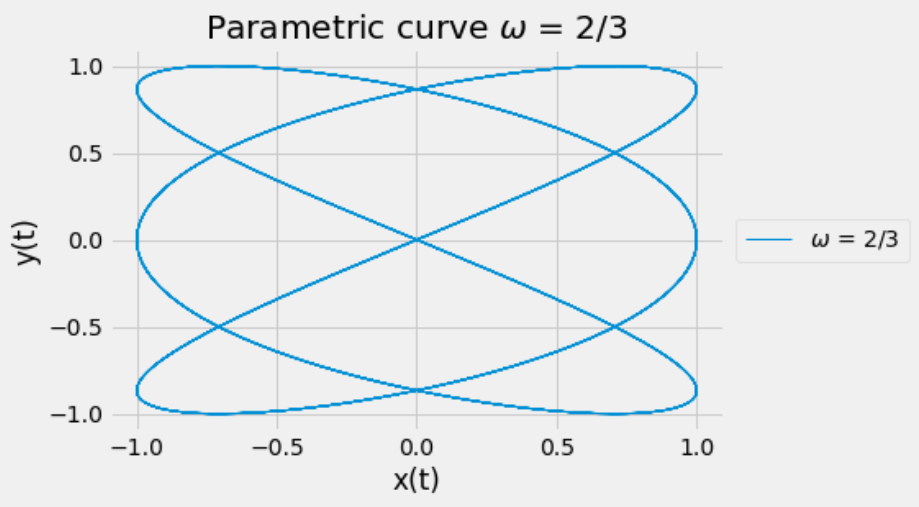
In [4]:
```
# Plot Parametric curve $\omega$ = 3
f = plt.figure()
plt.plot(xa,ya,  linewidth = 1.0,label = '$\omega$ = 3')

plt.legend(loc='center left', bbox_to_anchor=(1,0.5))
plt.xlabel('x(t)')
plt.ylabel('y(t)')
plt.title('Parametric curve $\omega$ =  3')

plt.show()
f.savefig("parametricw1.pdf", format = 'pdf', bbox_inches = "tight")
```



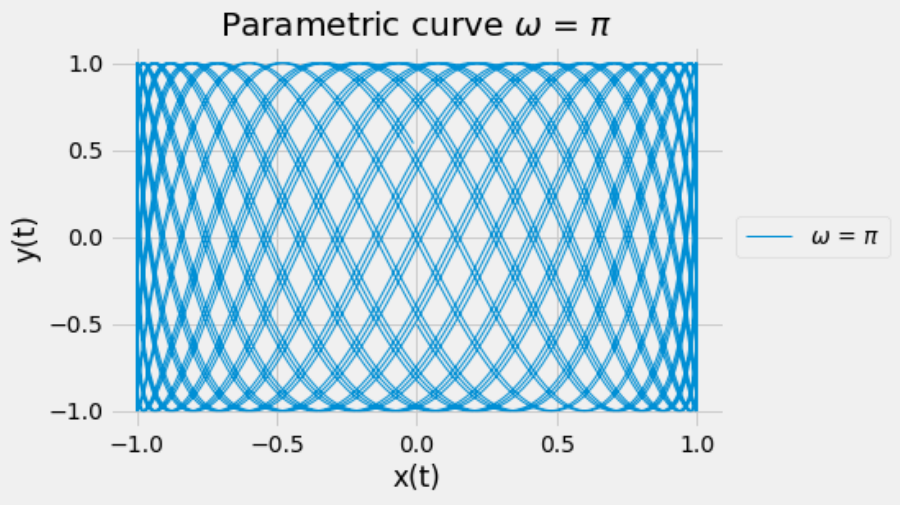
In [5]:
```
# Plot parametric curve $\omega$ =  $2^{1/2}$
f = plt.figure()
plt.plot(xb,yb, linewidth = 1.0,label = '$\omega$ = $2^{1/2}$')
plt.legend(loc='center left', bbox_to_anchor=(1,0.5))
plt.xlabel('x(t)')
plt.ylabel('y(t)')
plt.title('Parametric curve $\omega$ =  $2^{1/2}$')
plt.show()
f.savefig("parametricw2.pdf", format = 'pdf', bbox_inches = "tight")
```



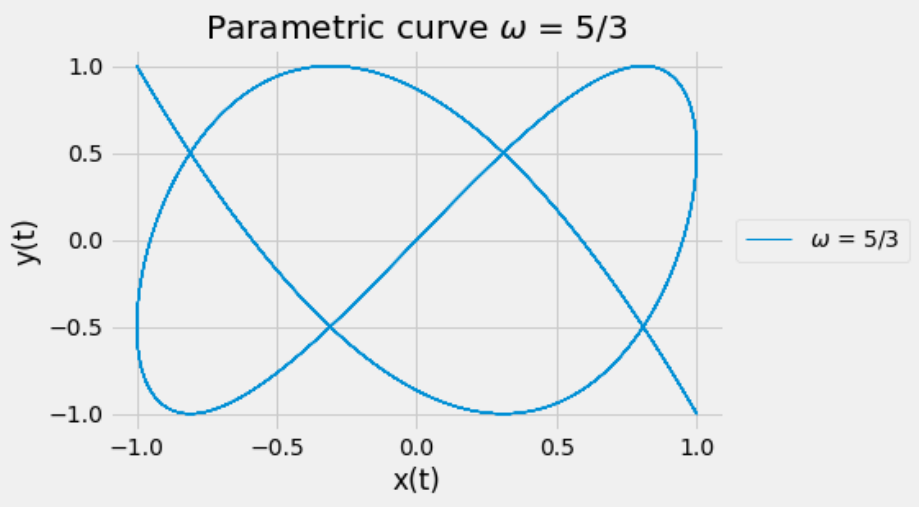
In [6]:
```
# Plot parameteric curvive $\omega$ = 2/3
f = plt.figure()
plt.plot(xc,yc,  linewidth = 1.0,label = '$\omega$ = 2/3')
plt.legend(loc='center left', bbox_to_anchor=(1,0.5))
plt.xlabel('x(t)')
plt.ylabel('y(t)')
plt.title('Parametric curve $\omega$ = 2/3')
plt.show()
f.savefig("parametricw3.pdf", format = 'pdf', bbox_inches = "tight")
```



In [7]:
```
# Plot parametric curve $\omega$ = pi
f = plt.figure()
plt.plot(xd,yd,  linewidth = 1.0,label = '$\omega$ = $\pi$')
plt.legend(loc='center left', bbox_to_anchor=(1,0.5))
plt.xlabel('x(t)')
plt.ylabel('y(t)')
plt.title('Parametric curve $\omega$ = $\pi$')
plt.show()
f.savefig("parametricw4.pdf", format = 'pdf', bbox_inches = "tight")
```



In [8]:
```
# Plot parametric curve $\omega$ = 5/3
f = plt.figure()
plt.plot(xe,ye,  linewidth = 1.0,label = '$\omega$ = 5/3')
plt.legend(loc='center left', bbox_to_anchor=(1,0.5))
plt.xlabel('x(t)')
plt.ylabel('y(t)')
plt.title('Parametric curve $\omega$ = 5/3')
plt.show()
f.savefig("parametricw5.pdf", format = 'pdf', bbox_inches = "tight")
```



In [9]:
```
# Plot parametric curve $\omega$ = 1/2(1+$5^{1/2}$)
f = plt.figure()
plt.plot(xf,yf,  linewidth = 1.0,label = '$\omega$ = 1/2(1+$5^{1/2}$)')
plt.legend(loc='center left', bbox_to_anchor=(1,0.5))
plt.xlabel('x(t)')
plt.ylabel('y(t)')
plt.title('Parametric curve $\omega$ = 1/2(1+$5^{1/2}$)')
plt.show()
f.savefig("parametricw6.pdf", format = 'pdf', bbox_inches = "tight")
```