Plotting Fourier Series
We plot the partial sums for the Fourier series for abs(x) on [-3,3].

First we compute the coefficients by hand.

a(0)=3 ,
a(m)=-6*(1-(-1)^m)/(m*pi)^2 for m>= 1 ,
b(m)=0 .

Next we make an M-file for the nth partial sum.

```
**************************************************************************

function w=summ(x,n)

w=3/2;
for m=1:n
  w=w-cos(m*pi*x/3)*6*(1-(-1)^m)/(m*pi)^2;
end

**************************************************************************
```

We want to compare summ(x,n) with the 6-periodic extension of abs(x) (See the example in HW.3) . Its M-file is

```
*************************************************************
function w=f(x)
z=6*floor((x+3)/6);
y=x-z;
w=abs(y);
*************************************************************
```

Now we go to the command window and plot summ(x,12) and f(x) on [-6,7] .
We use "hold on" and "hold off" to plot the graphs together.

```
**************************************************************************

hold on
fplot('summ(x,12)',[-6,7])
fplot('f(x)',[-6,7])
hold off;

**************************************************************************
```

To see how far apart the graphs are find the maximum of abs(f(x)-summ(x,12)) . (See HW.2).

ASSIGNMENT 7 :

Let f(x)=x^2 for -2<=x<2 .

Find the Fourier series for f on [-2,2]. Plot the partial series for f,summ(x,8) together with a plot of the 4-periodic extension of f(x) on [-5,6].

For what n is the maximum of abs(f(x)-summ(x,n)) on [-5,6] less than 0.1?