clc

clear all

close all

dbstop if error

for i=1:4

N=i\*5;

syms x;

f1=(-2)\*pi\*(2\*x-1);

f2=1.\*(x^0);

f3=0.\*(x^0);

count=1;

for k=(-N:N)

basis=exp((-1)\*i\*k\*x);

fourier\_coeffs(count)=(1/(2\*pi))\*(int(f1\*basis,-pi,-pi/3)+int(f2\*basis,-pi/3,pi/3)+int(f3\*basis,pi/3,pi));

count=count+1;

end;

domain=-pi:1/(100\*pi):pi;

basis = exp(1\*i\*(-N:N).'\*domain);

fourier\_approx = fourier\_coeffs\*basis;

plot(domain,fourier\_approx,'r')

hold all

original\_func = [subs(f1,x,-pi:1/(100\*pi):-pi/3) subs(f2,x,-pi/3:1/(100\*pi):pi/3) subs(f3,x,pi/3:1/(100\*pi):pi)];

plot(domain,original\_func)

hold all

end;