

---

```

clear all; clf; close all; clc;
N = 100;
tnum=10000;

tnumdiv2 = tnum/2;
t = linspace(0,1,tnum);

FS = calcFS(N,t);
realfunc(1,1:tnumdiv2) = t(1,1:tnumdiv2);
realfunc(1,tnumdiv2:tnum) = t(1,tnumdiv2:tnum)-1;

figure()
hold on

plot(t,realfunc,t,FS,LineWidth=1.5)
hold off
title('Given Funtion and Fourier Transform N=100')
xlabel('time t')
ylabel('y axis')
set(findall(gcf,'-property','FontSize'),'FontSize',15)
legend('Given Funtion','Fourier Transform')

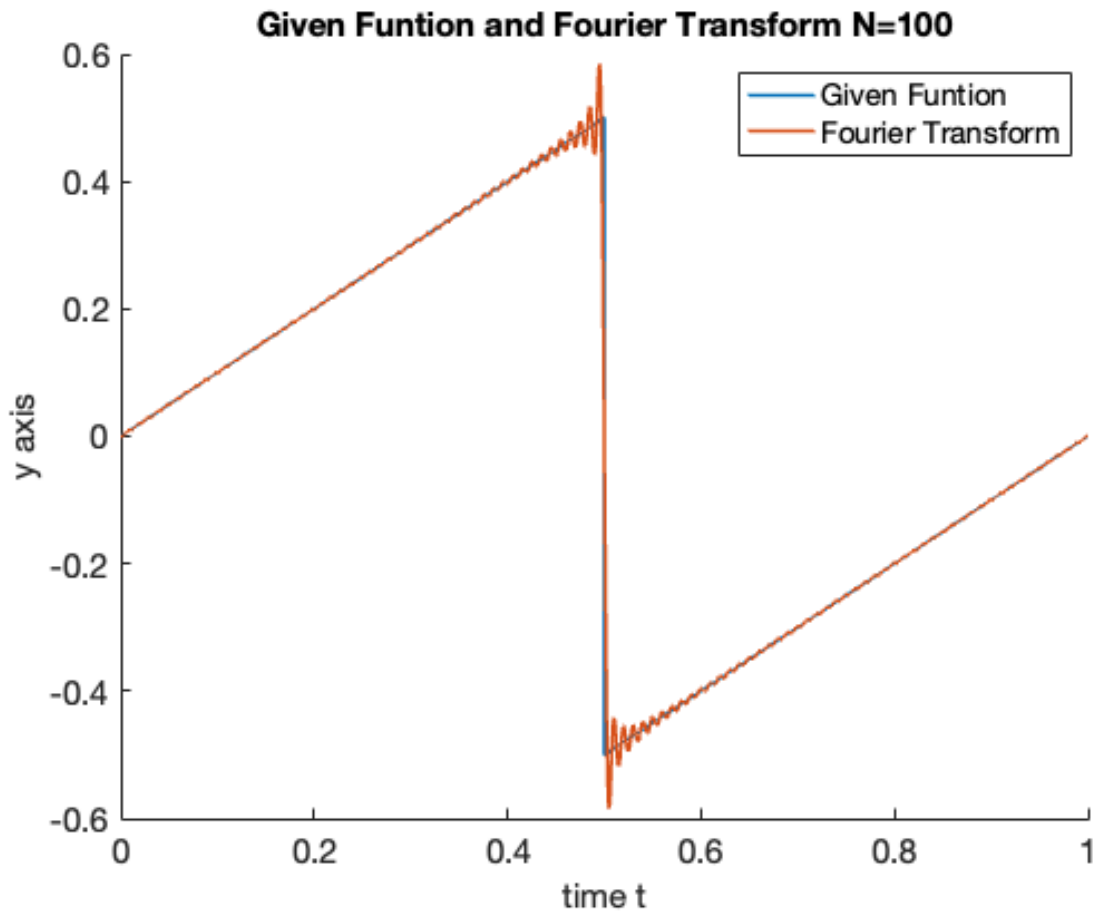
figure()
N1=linspace(1,100);
S = zeros(1,100);
for i = 1:100
    FS1 = calcFS(N1(i),t);

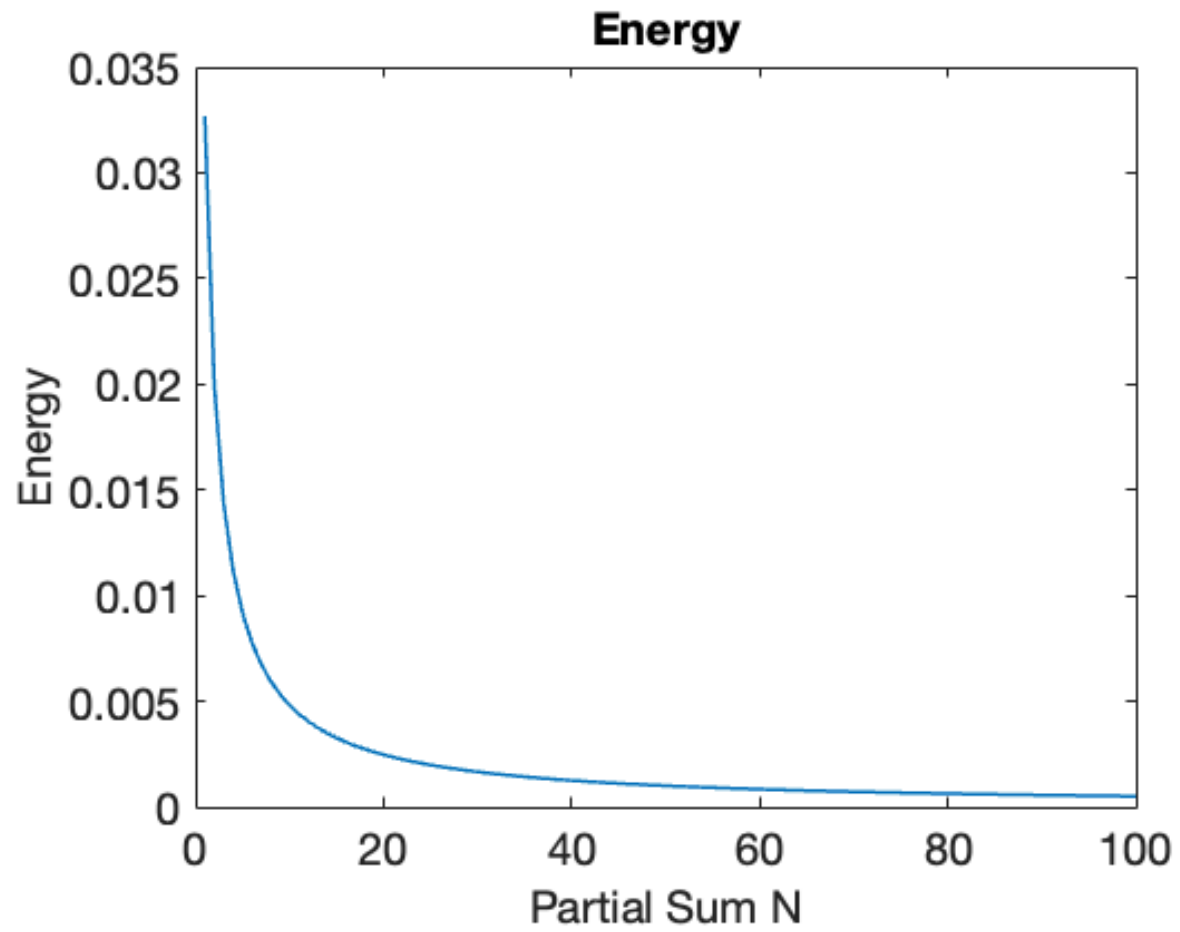
    difffunc = abs(realfunc-FS1).^2;
    S(i) = trapz(t,difffunc);
end
plot(N1,S,LineWidth=1.5)
title('Energy')
xlabel('Partial Sum N')
ylabel('Energy')
set(findall(gcf,'-property','FontSize'),'FontSize',20)

function FS = calcFS(N,t)
FS = 0;
for k = 1:N
    FS = FS + 1/(pi*k)*(-1)^(k+1).*sin(2*pi*k*t);
end
end

```

---





*Published with MATLAB® R2022a*