lab work 13:

19L-1316:

task 1:

syms t w;

x=heaviside(t+2)-heaviside(t-2);

X=fourier(x)

xx\_shift=heaviside(t)-heaviside(t-4);

XX\_shift=fourier(xx\_shift)

t=[-6:0.01:6];

to=2;

x=heaviside(t+2)-heaviside(t-2);

w=[-2\*pi:0.01:2\*pi];

X=(cos(2\*w)\*1i+sin(2\*w))./w-(cos(2\*w)\*1i-sin(2\*w))./w;

X\_shift=X.\*exp(-j\*w\*to);

xx\_shift=heaviside(t)-heaviside(t-4);

XX\_shift =(cos(4\*w)\*1i+sin(4\*w))./w-1i./w;

subplot(3,3,1);

plot(t,x);

axis([-5 5 0 1])

title('x(t)=rect(t/4)')

subplot(3,3,2);

plot(w,abs(X));

axis([-5 5 0 4])

title('|x(w)|')

subplot(3,3,3);

plot(w,angle(X));

axis([-5 5 0 4])

title('Phase')

subplot(3,3,4);

plot(t+to,x);

axis([-5 5 0 1])

title('x(t-2)')

subplot(3,3,5);

plot(w,abs(X\_shift));

axis([-5 5 0 4])

title('|Xshift(w)|')

subplot(3,3,6);

plot(w,angle(X\_shift));

axis([-5 5 0 4])

title('Phase')

subplot(3,3,7);

plot(t,xx\_shift);

axis([-5 5 0 1])

title('F^-^1(Xshift)')

subplot(3,3,8);

plot(w,abs(XX\_shift));

axis([-5 5 0 4])

title('|X(w)e^-^2^j^w|')

subplot(3,3,9);

plot(w,angle(XX\_shift));

axis([-5 5 0 4])

title('Phase')



task # 2

syms t;

x=heaviside(t+2)-heaviside(t-2);

x\_shift=heaviside(t+2)-heaviside(t-2)\*exp(j\*2\*t);

X=fourier(x)

X\_shift=fourier(x\_shift)

t=[-10:0.01:10];

to=2;

x=heaviside(t+2)-heaviside(t-2);

x\_shift=heaviside(t+2)-heaviside(t-2).\*(j\*2\*t);

w=[-3\*pi:0.01:3\*pi];

X=(2\*sin(2\*w-4))./(w-2);

Xo=(2\*sin(2\*w))./w;

X\_shift=(2\*sin(2\*(w-2)))./(w-2);

subplot(3,3,1);

plot(t,x);

axis([-5 5 0 1])

title('x(t)=rect(t/4)')

subplot(3,3,2);

plot(w,abs(Xo));

axis([-10 10 0 4])

title('|x(w)|')

subplot(3,3,3);

plot(w,angle(Xo));

axis([-10 10 0 4])

title('Phase')

subplot(3,3,4);

plot(t,x\_shift);

axis([-5 5 -2 1])

title('xshift(t)')

subplot(3,3,5);

plot(w,abs(X\_shift));

axis([-10 10 0 4])

title('|Xshift(w)|')

subplot(3,3,6);

plot(w,angle(X\_shift));

axis([-10 10 0 4])

title('Phase')

subplot(3,3,7);

plot(t,x\_shift);

axis([-5 5 -1 1])

title('F^-^1(Xshift)')

subplot(3,3,8);

plot(w,abs(X\_shift));

axis([-10 10 0 4])

title('|X(w)e^-^2^j^w|')

subplot(3,3,9);

plot(w,angle(X\_shift));

axis([-10 10 0 4])

title('Phase')

