n = 1: 1 : 100;

x = sin(2\*pi\*(n-1)/20);

figure

plot(n,x);

l = 3

fc = 0.05

fs = 20

[b,a] = butter(l, fc/(fs/2),’low’);

[H,w] = freqz(b,a,fs);

h = ifft(H);

y = conv(h,x);

n = 1:(pi-1)/(length(H)-1):pi;

subplot(3,3,1);

plot(db(abs(H)));

subplot(3,3,2);

plot(angle(H));

subplot(3,3,3);

plot(y);

n = 1:1:1000;

x = cos(2\*pi\*(n-1)\*0.002)+2\*cos(2\*pi\*100\*(n-1)\*0.002);

subplot(3,1,1);

plot(n,x);

fs = 500;

fc = 10;

[b,a] = butter(16, fc/(fs/2),’low’);

[H,w] = freqz(b,a,fs);

h = ifft(H);

y = conv(h,x);

subplot(3,1,2);

fc = 100

[b,a] = butter(3,[fc-10 fc+10],'bandpass');

[H,w] = freqz(b,a,fs);

h = ifft(H);

y = conv(h,x);

subplot(3,1,3);

1.(b)b=4.76951788912121e-07 1.43085536673636e-06 1.43085536673636e-06 4.76951788912121e-07

A=1 -2.96858439637183 2.93766032527870 -0.969072113292554

1.(c)b=1.31340812418075e-08 9.19385686926525e-08 2.75815706077957e-07 4.59692843463262e-07 4.59692843463262e-07 2.75815706077957e-07 9.19385686926525e-08 1.31340812418075e-08

A=1 -6.29419251330515 17.0111363742929 -25.5884134584026 23.1343310405130 -12.5701504060586 3.80048861479016 -0.493197970667218

1.(d)b=0.166666666666667 0.500000000000000 0.500000000000000 0.166666666666667

a=1 -4.16333634234434e-16 0.333333333333333 -1.85037170770859e-17