%Signal and System experiment.

%Using Matlab.

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%class05022011 2041

%2022/4/18 15:30 @room 904

%1-1

syms t

x=(1-exp(-0.5\*t))\*heaviside(t)

ezplot(x)



%1-2

syms t

x=cos(pi\*t)\*(heaviside(t)-heaviside(t-2))

ezplot(x)



%1-3

syms t

x=abs(t)\*0.5\*cos(t\*pi)\*(heaviside(t+2)-heaviside(t-2))

ezplot(x)



%1-4

syms t

x=exp(-t)\*sin(2\*pi\*t)\*(heaviside(t)-heaviside(t-3))

ezplot(x)



%2-1

n=-2:10

y=heaviside(n-3)

stem(n,y,'filled')

xlabel('n')

title('u(n-3)')



%2-2

n=-2:10

y=heaviside(n).\*((-1/2).^n)

stem(n,y,'filled')

xlabel('n')

title('$(-\frac{1}{2})^{n}u(n)$','Interpreter','latex')



%2-3

n=-2:7

y=n.\*(heaviside(n)-heaviside(n-5))

stem(n,y,'filled')

xlabel('n')

title('n[u(n)-u(n-5)]')



%2-4

n=-2:10

y=heaviside(n).\*sin(n\*pi/2)

stem(n,y,'filled')

xlabel('n')

title('sin$\frac{n\pi}{2}$u(n)','Interpreter','latex')



%3

t =linspace(0,6);

y = 3\*square(t\*pi);

plot(t,y)

axis([-2 8 -2 4])

xlabel('t')

title('square wave')



%4-1

x=0:0.01:4

y=4-x;

z=sin(2\*pi\*x)

plot(x,y+z)



%4-2

x=0:0.01:4

y=4-x;

z=sin(2\*pi\*x)

plot(x,y.\*z)



%4-3

x=-4:0.01:4

y=(4+x).\*(x<0)+(4-x).\*(x>=0)

plot(x,y)



%4-4

t=1:0.01:5

x1=5-t

x2=sin(2\*pi\*(t-1))

x3=x1+x2

x4=sin(2\*pi\*t)

plot(t,x3.\*x4)



%5

x=-3:3

y=[0 1 2 3 3 3 3]

subplot(411)

stem(x,y,'filled')

subplot(412)

stem(-x,y,'filled')

subplot(413)

stem(x+2,y,'filled')

subplot(414)

stem(2-x,y,'filled')



%6

t=-20:0.01:20

x1=1+cos(pi\*t/4-pi/3)+2\*cos(pi\*t/2-pi/4)+cos(2\*pi\*t)

x2=sin(t)+2\*sin(pi\*t)

n=-20:20

y1=2+3\*sin(2\*n\*pi/3-pi/8)

y2=cos(n\*pi/6)+sin(n\*pi/3)+cos(n\*pi/2)

subplot(411)

plot(t,x1)

subplot(412)

plot(t,x2)

subplot(413)

stem(n,y1,'filled')

subplot(414)

stem(n,y2,'filled')

