

Señales y sistemas

Señales continuas y discretas



Asistencia

$$\int_{-\infty}^{\infty} e^{-at}$$

$$x = \sin(\omega t)$$

Señal continua:= x(t)

Señal discreta:= x[n]

Handles vs symbolic

```
syms t

%Variable simbólica
y_symb=cos(t)
```

```
y_symb = cos(t)
```

```
%Function handle
y_fh= @(t) cos(t)
```

```
y_fh = function_handle with value:
      @(t)cos(t)
```

```
%Diferencia entre variables simbólicas y function handles
y_fh([5 8 10]) %Se evalúan directamente
```

```
ans = 1x3
      0.2837   -0.1455   -0.8391
```

```
%y_symb([5 8 10]) %Error: NO se evalúan directamente
subs(y_symb,t,[5 8 10])
```

```
ans = (0.2837   -0.1455   -0.8391)
```

```
%Se puede hacer algebra con variables simbólicas
y_3=y_symb+sin(t)+exp(-t)
```

```
y_3 = e-t + cos(t) + sin(t)
```

```
diff(y_3)
```

```
ans =  $\cos(t) - e^{-t} - \sin(t)$ 
```

```
int(y_3,[0 1])
```

```
ans = 1.9333
```

```
int(y_3,t)
```

```
ans =  $-e^{-t} - 1.4142 \cos(t + 0.7854)$ 
```

```
%y_fh+y_fh %Error: No se pueden hacer operaciones con function handle  
y_3_fh=matlabFunction(y_3)
```

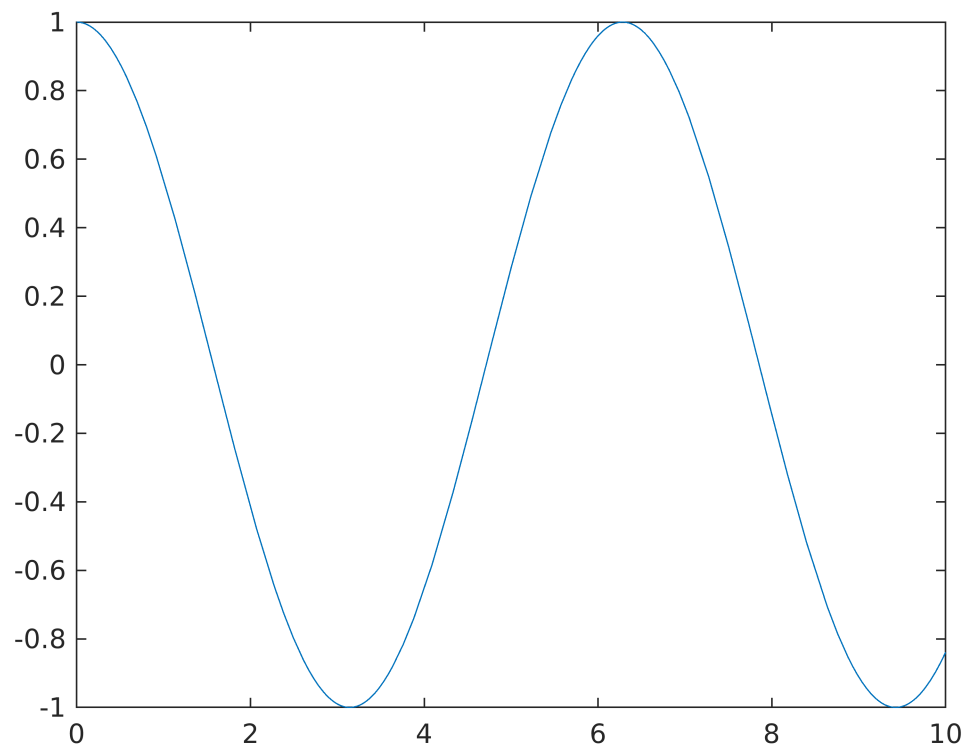
```
y_3_fh = function_handle with value:  
@(t)exp(-t)+cos(t)+sin(t)
```

```
y_3_fh([5 8 10])
```

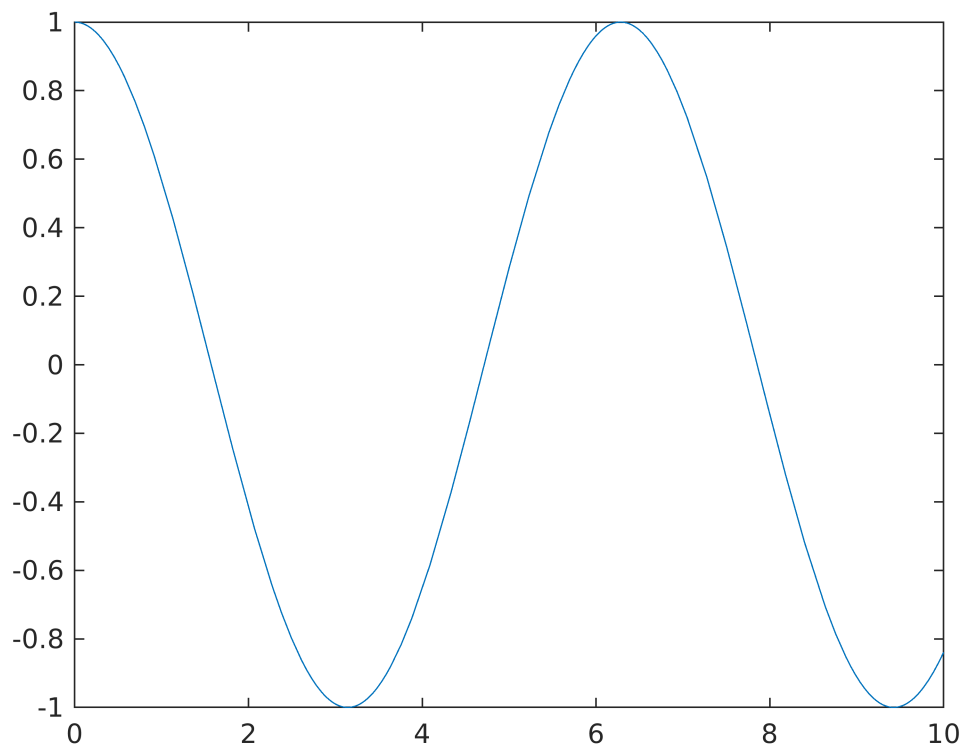
```
ans = 1x3  
    -0.6685    0.8442   -1.3830
```

Continuas vs discretas

```
%fplot es para funciones simbólicas  
%y también para "function handles"  
figure  
fplot(y_symb,[0 10])
```



```
figure  
fplot(y_fh,[0 10])
```



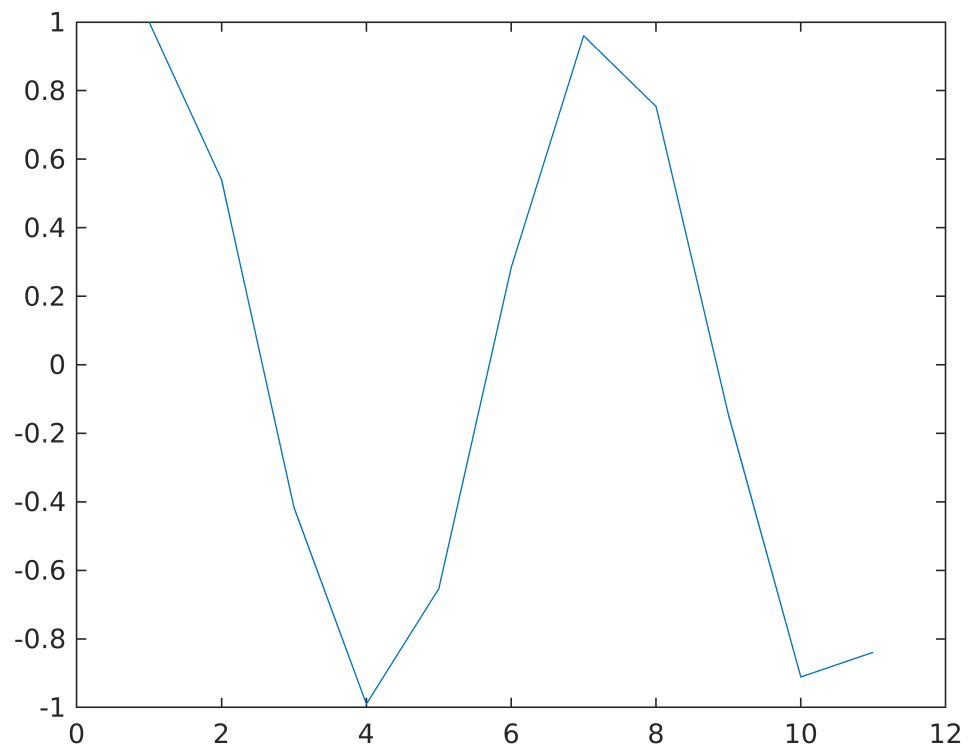
```
%";" suprime la salida en los resultados
t_disc=0:10
```

```
t_disc = 1x11
    0     1     2     3     4     5     6     7     8     9    10
```

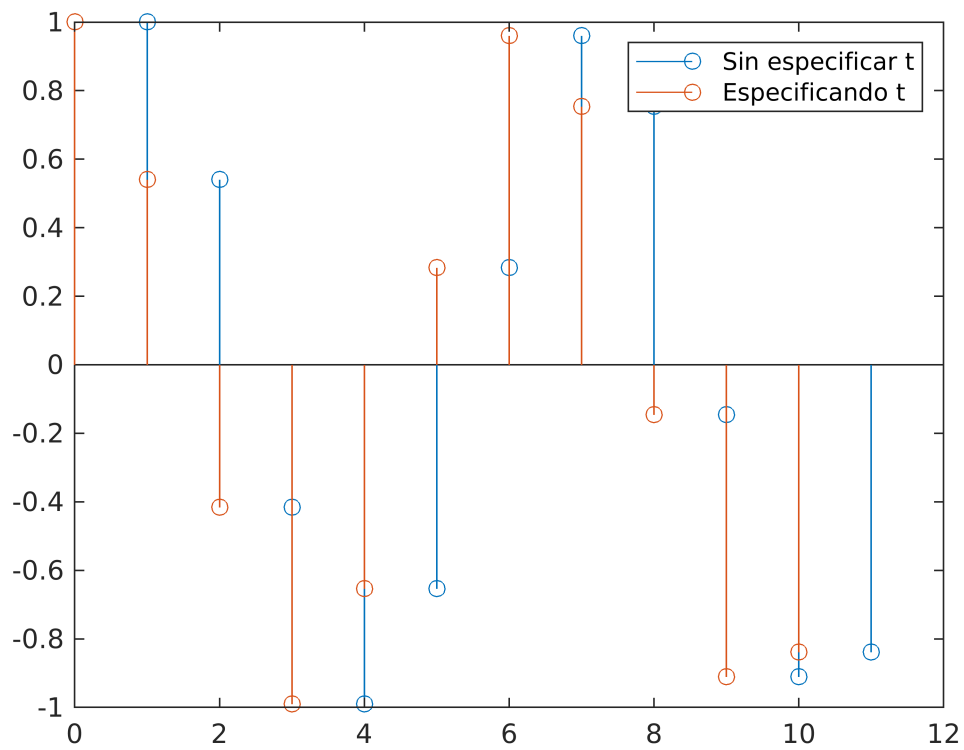
```
t_disc=0:10;
y_disc=y_fh(t_disc)
```

```
y_disc = 1x11
    1.0000    0.5403   -0.4161   -0.9900   -0.6536    0.2837    0.9602    0.7539 ...
```

```
figure
%plot es para muestras o vectores
plot(y_disc)
```



```
figure
stem(y_disc)
hold on
%figure
%stem es para muestras o vectores
stem(t_disc,y_disc)
hold off
legend("Sin especificar t","Especificando t")
```



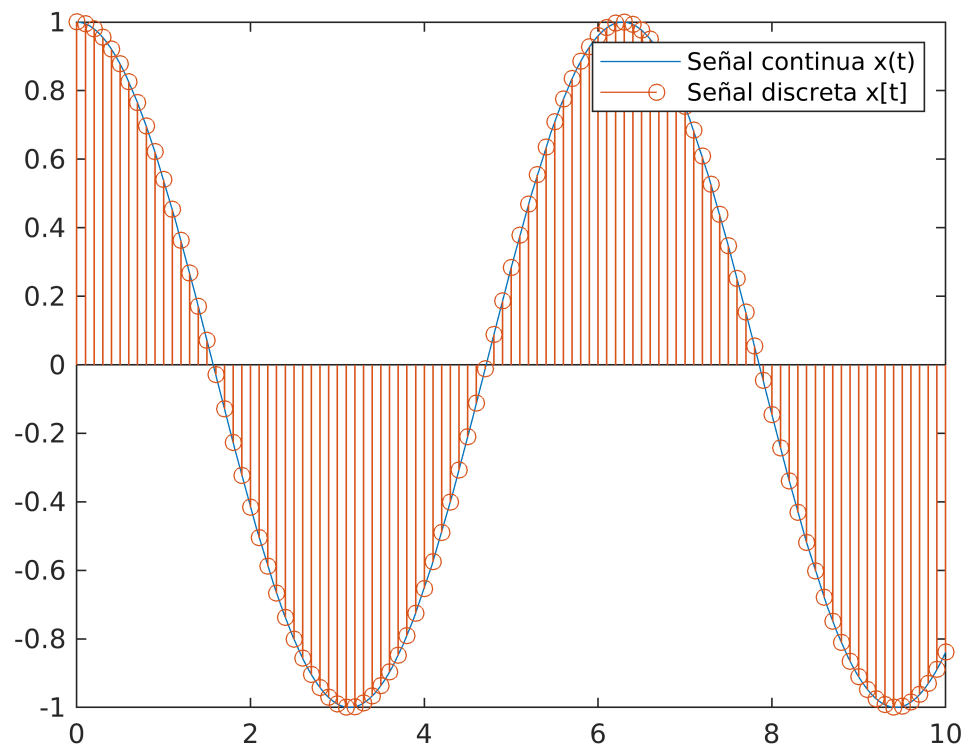
```
t_disc=0:0.1:10
```

```
t_disc = 1x101
    0    0.1000    0.2000    0.3000    0.4000    0.5000    0.6000    0.7000 ...
```

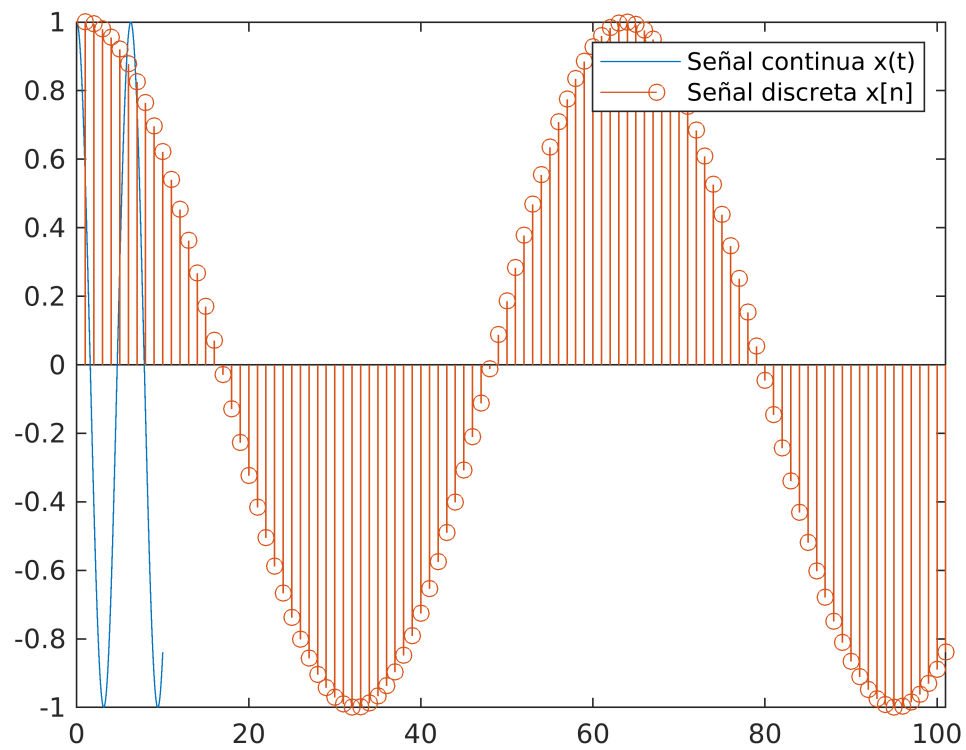
```
y_disc=y_fh(t_disc)
```

```
y_disc = 1x101
    1.0000    0.9950    0.9801    0.9553    0.9211    0.8776    0.8253    0.7648 ...
```

```
figure
fplot(y_fh,[0 10])
hold on
stem(t_disc,y_disc)
hold off
legend("Señal continua x(t)","Señal discreta x[t]")
```



```
figure
fplot(y_fh,[0 10])
hold on
stem(y_disc)
hold off
legend("Señal continua x(t)","Señal discreta x[n]")
```

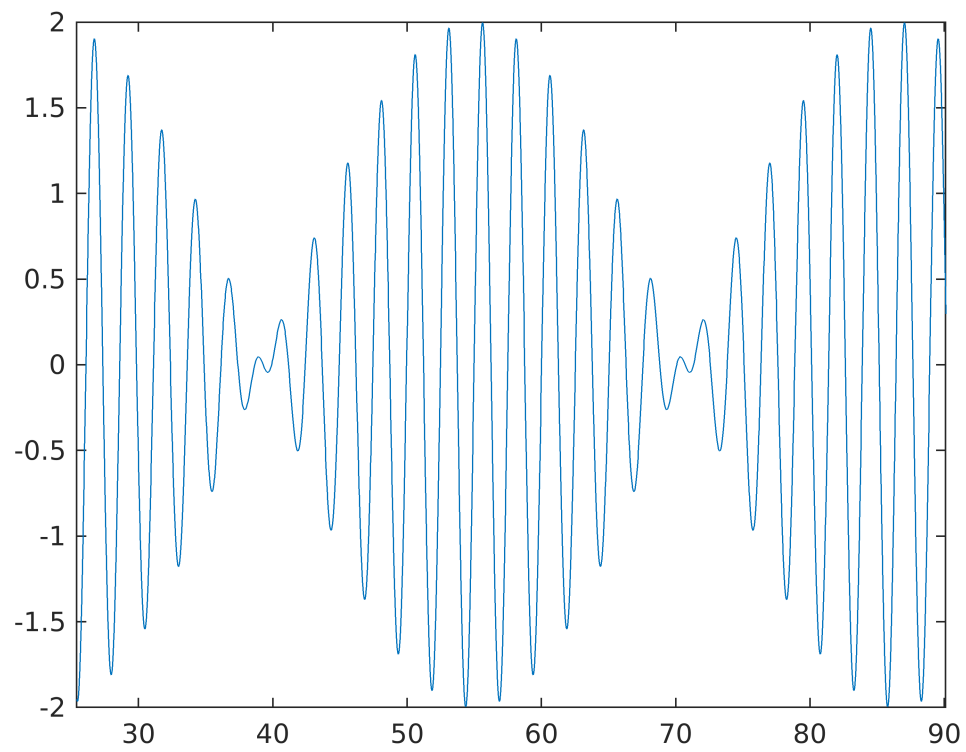


Formas de onda básicas

```
syms t
a=2.6;
b=2.4;
t0=25.4;
tf=90.1;

x=cos(a*t)+sin(b*t);

figure
fplot(x,[t0 tf])
```

```
C=0.5;  
r=-2.9;  
omega_0=30.5;  
theta=2.3;  
  
x=C*exp(r*t)*cos(omega_0*t+theta);  
  
figure  
fplot(x,[0 1])
```

