```
n = -100:1:100
```

```
n = 1×201
  -100   -99   -98   -97   -96   -95   -94   -93   -92   -91   -90   -89   -88 ···
```

```
T0 = 0.5
```

```
T0 = 0.5000
```

```
Ts = 0.01
```

```
Ts = 0.0100
```

```
wo = (2 * 3.14) / T0
```

```
wo = 12.5600
```

```
xpls = exp((1 + 1i * wo) * Ts * n)
```

```
xpls = 1×201 complex
   0.3679 + 0.0023i   0.3683 + 0.0489i   0.3629 + 0.0956i   0.3516 + 0.1417i ···
```

```
xmin = exp((-1 + 1i * wo) * Ts * n)
```

```
xmin = 1×201 complex
   2.7182 + 0.0173i   2.6678 + 0.3541i   2.5766 + 0.6787i   2.4467 + 0.9862i ···
```

```
Xrplus = real(xpls)
```

```
Xrplus = 1×201
    0.3679    0.3683    0.3629    0.3516    0.3344    0.3115    0.2831    0.2497 ···
```

```
Xiplus = imag(xpls)
```

```
Xiplus = 1×201
    0.0023    0.0489    0.0956    0.1417    0.1865    0.2292    0.2691    0.3055 ···
```

```
Xrmin = real(xmin)
```

```
Xrmin = 1×201
    2.7182    2.6678    2.5766    2.4467    2.2809    2.0826    1.8556    1.6040 ···
```

```
Ximin = imag(xmin)
```

```
Ximin = 1×201
    0.0173    0.3541    0.6787    0.9862    1.2722    1.5325    1.7636    1.9624 ···
```

```
grid on

subplot(2,4,1)
plot(n, Xrplus, 'b<')
subtitle("real(x[n]), =1")
xlabel('n')
ylabel('Amplitude')
xticks([-100 -50 0 50 100])
yticks([-4 -2 0 2 4])
```

```
axis square

subplot(2,4,2)
plot(n, Xiplus, 'c<')
subtitle("imag(x[n]), =1")
xlabel('n')
ylabel('Amplitude')
xticks([-100 -50 0 50 100])
yticks([-4 -2 0 2 4])
axis square

% % % % % % % % % % % % % % % %

subplot(2,4,3)
plot(n, Xrplus + rand(size(Xrplus)), 'g<')
subtitle("real(x[n]) + noise, =1")
xlabel('n')
ylabel('Amplitude')
xticks([-100 -50 0 50 100])
yticks([-4 -2 0 2 4])
axis square

subplot(2,4,4)
plot(n, Xiplus + rand(size(Xiplus)), 'black<')
subtitle("imag(x[n]) + noise, =1")
xlabel('n')
ylabel('Amplitude')
xticks([-100 -50 0 50 100])
yticks([-4 -2 0 2 4])
axis square

% % % % % % % % % % % % % % % %

subplot(2,4,5)
plot(n, Xrmin, 'm<')
subtitle("real(x[n]), =-1")
xlabel('n')
ylabel('Amplitude')
xticks([-100 -50 0 50 100])
yticks([-4 -2 0 2 4])
axis square

subplot(2,4,6)
plot(n, Ximin, 'r<')
subtitle("imag(x[n]), =-1")
xlabel('n')
ylabel('Amplitude')
xticks([-100 -50 0 50 100])
yticks([-4 -2 0 2 4])
axis square

% % % % % % % % % % % % % % % %

subplot(2,4,7)
```

```
plot(n, Xrmin + rand(size(Xrmin)), 'white<')
subtitle("real(x[n]) + noise, =-1")
xlabel('n')
ylabel('Amplitude')
color=gca
```

```
color =
  Axes with properties:

            XLim: [-100 100]
            YLim: [-2 4]
          XScale: 'linear'
          YScale: 'linear'
    GridLineStyle: '-'
         Position: [0.5422 0.1100 0.1566 0.3412]
            Units: 'normalized'

  Show all properties
```

```
color.Color = 'g'
```

```
color =
  Axes with properties:

            XLim: [-100 100]
            YLim: [-2 4]
          XScale: 'linear'
          YScale: 'linear'
    GridLineStyle: '-'
         Position: [0.5422 0.1100 0.1566 0.3412]
            Units: 'normalized'

  Show all properties
```

```
xticks([-100 -50 0 50 100])
yticks([-4 -2 0 2 4])
axis square

subplot(2,4,8)
plot(n, Ximin + rand(size(Ximin)), 'yellow<')
subtitle("imag(x[n]) + noise, =-1")
xlabel('n')
ylabel('Amplitude')
xticks([-100 -50 0 50 100])
yticks([-4 -2 0 2 4])
axis square

% % % % % % % % % % % % % % % %



sgtitle("x[n] = e^{(\sigma + j * w0) * Ts * n}")
```

$$x[n] = e^{(\sigma + j * w0) * Ts * n}$$