Análisis de Señales

CURSO 2022 – PROF. JORGE RUNCO

Ej.1)TP1

```
%Rampa
function y=rampa(t)
y=t.*(t>=0);
End

%Triángulo del ej.1
function y=triej1a(t)
y=rampa(t+1)-2*rampa(t-1)+rampa(t-3);
end
```

```
t=-5:0.01:5;
g=triej1a(t);
plot(t, g, '. r');grid on;
a=triej1a(t-1);
figure, plot(t,a,'.m'); grid on;
b=-triej1a(3.*t);
figure, plot(t,b,'.g'); grid on;
t=-20:0.01:20;
f=2.*triej1a(-0.5.*(t+10));
figure, plot(t,f,'.c'); grid on;
```

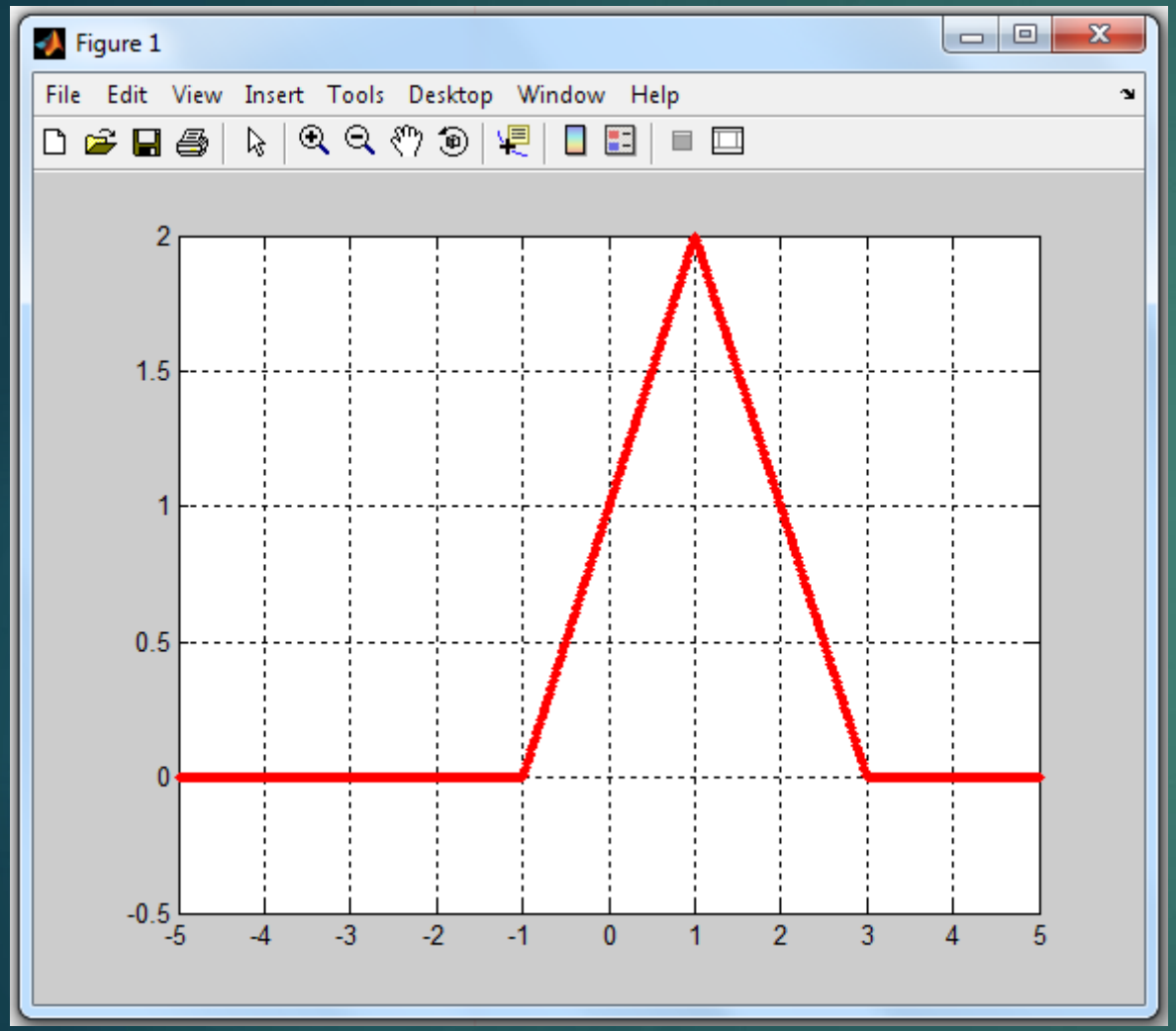
Figure 1
File Edit View Insert Tools Desktop Window Help
2
1.5
1
0.5
0
-0.5
-5 -4 -3 -2 -1 0 1 2 3 4 5

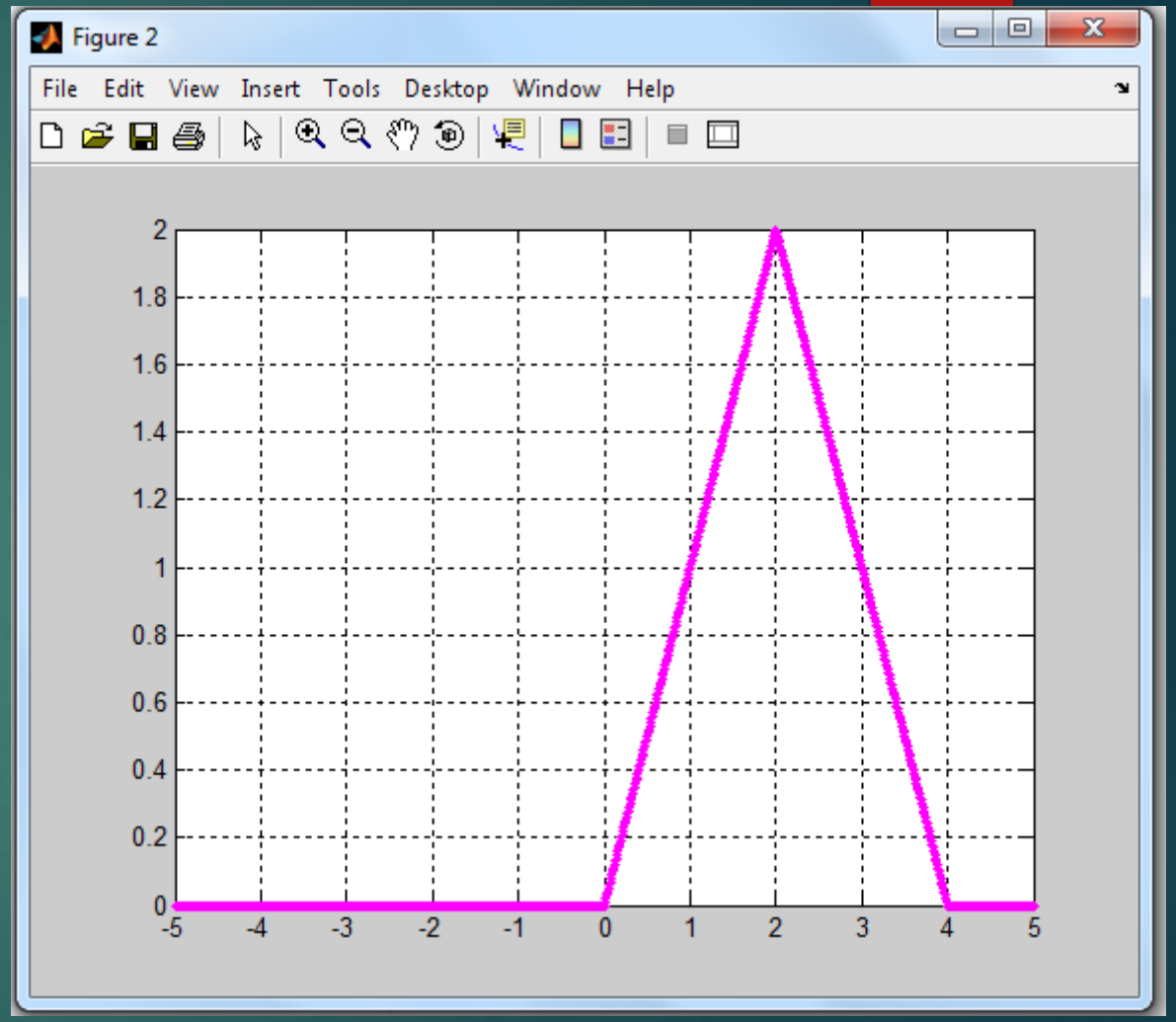
Figure 2
File Edit View Insert Tools Desktop Window Help
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
-5 -4 -3 -2 -1 0 1 2 3 4 5

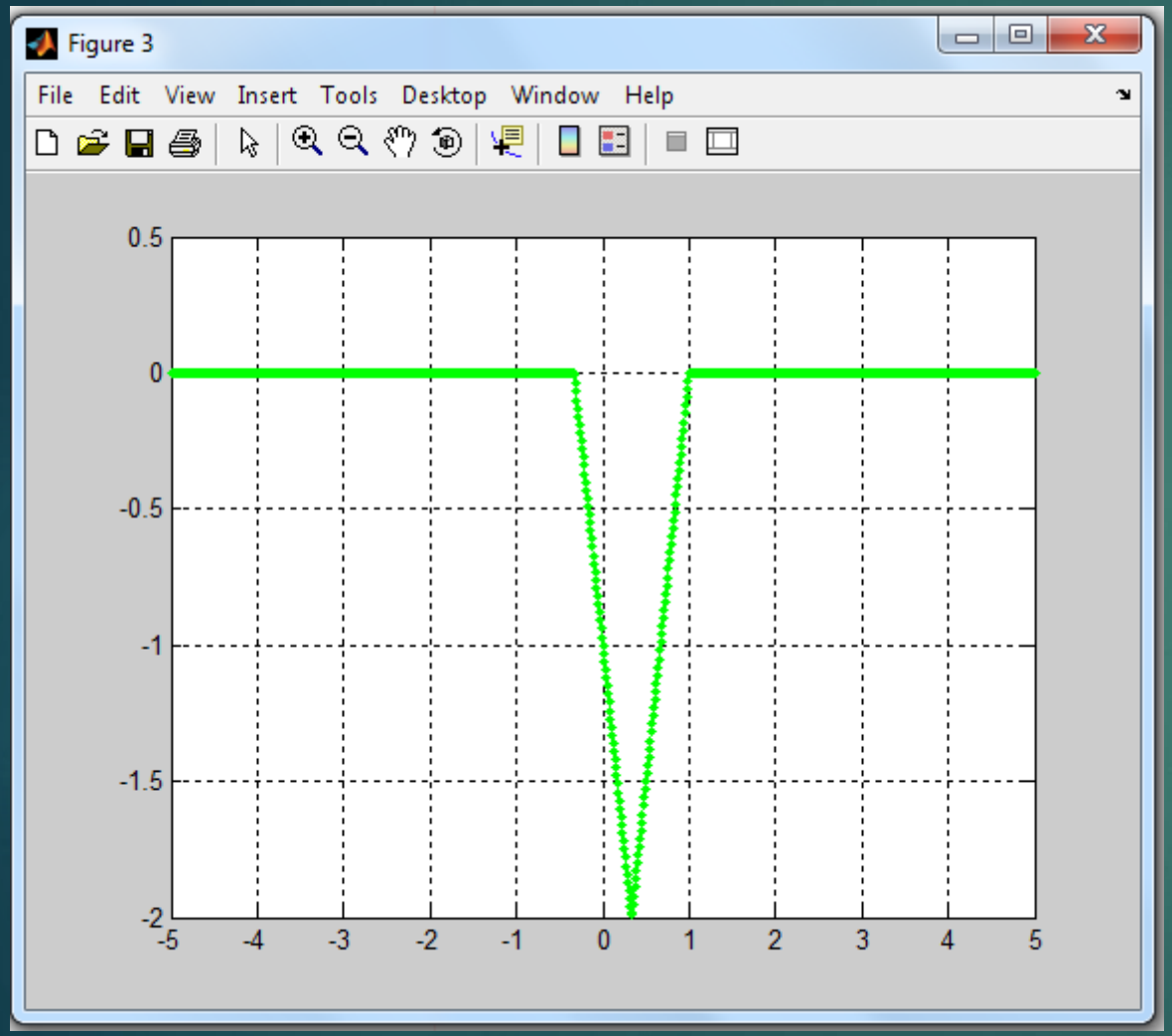
Figure 3
File Edit View Insert Tools Desktop Window Help
0.5
0
-0.5
-1
-1.5
-2
-5 -4 -3 -2 -1 0 1 2 3 4 5

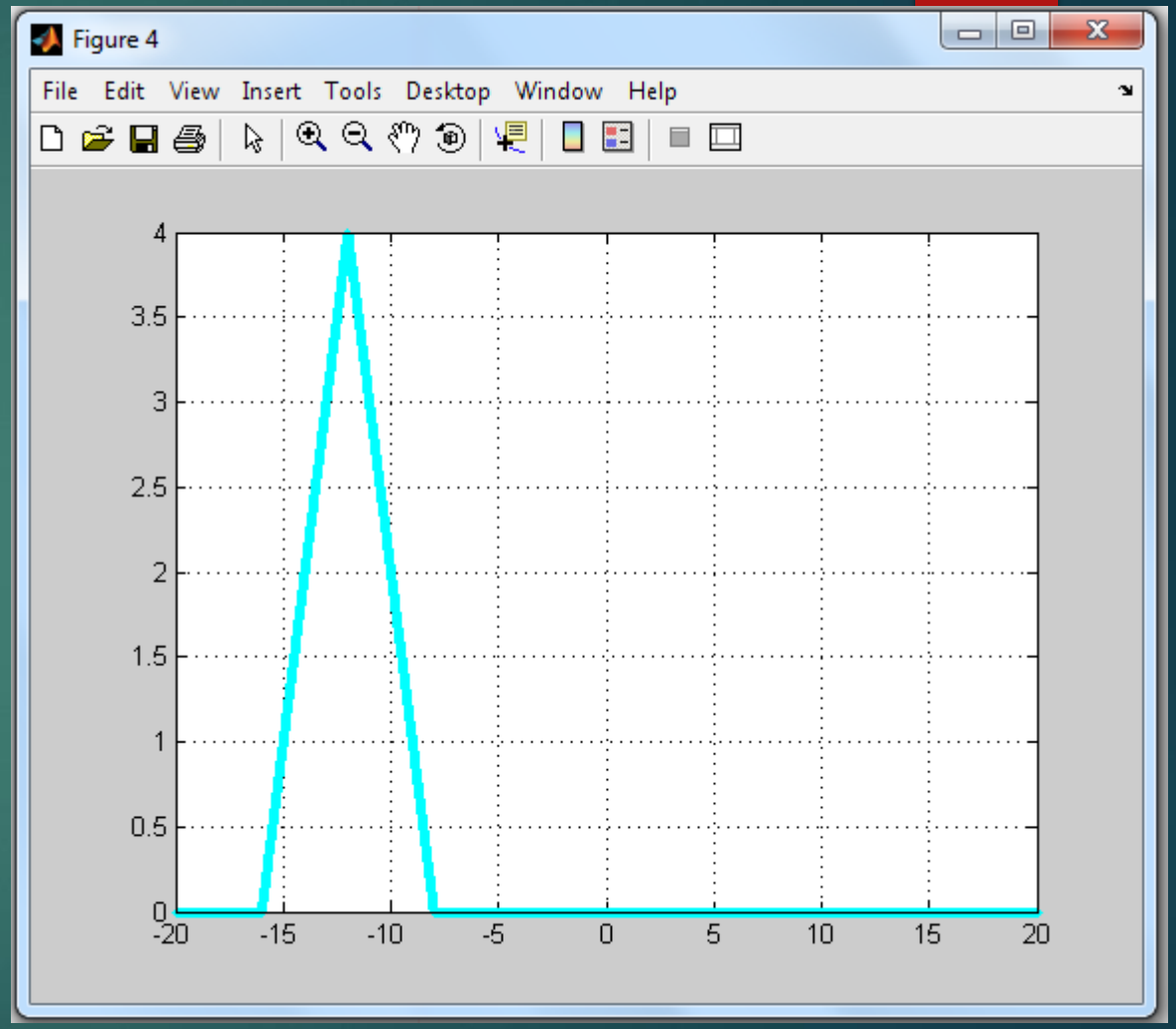
Figure 4
File Edit View Insert Tools Desktop Window Help
4
3.5
3
2.5
2
1.5
1
0.5
0
-20 -15 -10 -5 0 5 10 15 20

Ej.5)a) → g(t)= $2t^2 - 3t + 6$

- $g_p(t) = \frac{g(t)+g(-t)}{2} = \frac{2t^2 -3t+6+2t^2+3t+6}{2} =$

  $\frac{4t^2+12}{2} = 2t^2 + 6$ ←

- $g_i(t) = \frac{g(t)-g(-t)}{2} = \frac{2t^2 -3t+6-2t^2-3t-6}{2} =$

  $\frac{-6t}{2} = -3t$ ←

Ej.6)a) → g(t) = 20 cos(40πt – π/4)

- $g(t) = 20\cos(40\pi t - {}^{\pi}/_{4}) =$
  $20\left[\cos(40\pi t)\cos\left(\frac{\pi}{4}\right) + \text{sen}(40\pi t)\,\text{sen}\left(\frac{\pi}{4}\right)\right]$
- $g_p(t) = 20 * \cos(40\pi t)\ \frac{\sqrt{2}}{2} = 14.14\cos(40\pi t)$ ⟵
- $g_i(t) = 20 * \text{sen}(40\pi t)\ \frac{\sqrt{2}}{2} = 14.14\,\text{sen}(40\pi t)$ ⟵

Ej.8) g[n] = cos[2πn/10]

- $Para\ ser\ periódica\ \ \omega_0\, N = 2\pi m\ \rightarrow$
- $\frac{2\pi}{10}\, N = 2\pi m\ \rightarrow$
- $N = 10\, m = 10\ (Período)$

Ej.8) g[n] = cos[πn/10]

- $Para\ ser\ periódica\ \ \omega_0\, N = 2\pi m\ \rightarrow$
- $\frac{\pi}{10}\, N = 2\pi m\ \rightarrow$
- $N = 20\, m = 20\ (Período)$

Ej.9) x[n] = A.cos[w_0n]

- $Para\ ser\ periódica\ se\ tiene\ que\ cumplir$
- $a)\omega_0 = 0.75\pi$
- $\omega_0\, N = 2\pi m \quad \rightarrow \quad N = \frac{2\pi m}{\omega_0} = \frac{2\pi m}{0.75\pi} \rightarrow N = 8\ para\ \ m = 3$
- $b)\omega_0 = 0.15\pi$
- $\omega_0\, N = 2\pi m \quad \rightarrow \quad N = \frac{2\pi m}{\omega_0} = \frac{2\pi m}{0.15\pi} \rightarrow N = 40\ para\ \ m = 3$
- $d)\omega_0 = \sqrt{2}\pi$
- $\omega_0\, N = 2\pi m \quad \rightarrow \quad N = \frac{2\pi m}{\omega_0} = \frac{2\pi m}{\sqrt{2}\pi} \rightarrow no\ es\ periódica$