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Ejercicio 1

Imprimir una tabla formateada (entero y real) del logaritmo natural de los números 10, 20, 40, 60, y 80. Sugerencia: usar el comando fprintf y vectores

```
x=[10;20;40;60;80];
y=[x,log(x)];
fprintf('\n numero natural log\n')
fprintf('%4i \t %8.3f\n',y')
```

```
 numero natural log
  10      2.303
  20      2.996
  40      3.689
  60      4.094
  80      4.382
```

ejercicio2

```
%Hallar el vector X para la siguiente ecuación matricial:
A=[4 -2 -10;2 10 -12;-4 -6 16];
b=[-10 32 -16]';
x=A\b
x1=inv(A)*b
```

```
x =

    2.0000
    4.0000
```

```
    1.0000


x1 =

     2
     4
     1
```

Ejercicio3

Para la matriz de coeficientes anterior hallar la factorización LU, es decir A = LU y aplicar a continuación X = U-1L-1B para resolver el sistema anterior.

```
[L U]=lu(A)
x1=inv(U)*inv(L)*b
```

```
L =

    1.0000         0         0
    0.5000    1.0000         0
   -1.0000   -0.7273    1.0000


U =

    4.0000   -2.0000  -10.0000
         0   11.0000   -7.0000
         0         0    0.9091


x1 =

     2
     4
     1
```

Ejercicio 4

```
%Hallar  los autovalores y autovectores de la matriz A:
A=[0 1 -1;-6 -11 6;-6 -11 5];
[X,D]=eig(A);
fprintf('\n Autovectores (Columnas de la matriz)\n')
X(:,1)
fprintf('\n Autovalores (Diagonal)\n')
```

```
 Autovectores (Columnas de la matriz)
```

```
ans =

    0.7071
    0.0000
    0.7071


 Autovalores (Diagonal)
```

Ejercicio 5

```
%calcular los voltajes de los nodods y la potencia de la fuente
Y=[1.5-2j -.35+1.2j;-.35+1.2j 0.9-1.6j];
I=[30+40j;20+15j]
V=Y\I
S=V.*conj(I)


I =

  30.0000 +40.0000i
  20.0000 +15.0000i


V =

   3.5902 +35.0928i
   6.0155 +36.2212i


S =

   1.0e+03 *

   1.5114 + 0.9092i
   0.6636 + 0.6342i
```

Ejercicio 6

function TorresHanoi(n, i, a, f) if (n > 0) TorresHanoi(n-1, i, f, a); fprintf('mover disco %d de %c a %c \n', n, i, f); TorresHanoi(n-1, a, i, f);

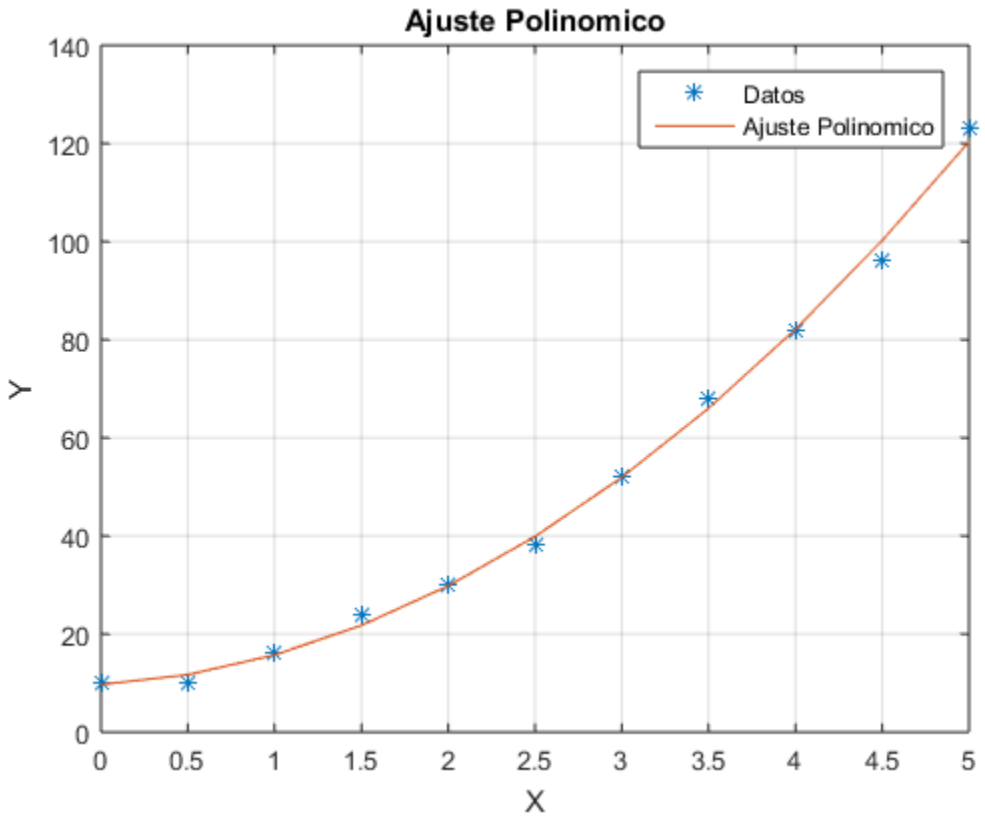
end

```
TorresHanoi(5,'a','b','c')

mover disco 1 de a a c
mover disco 2 de a a b
mover disco 1 de c a b
mover disco 3 de a a c
mover disco 1 de b a a
```

```
mover disco 2 de b a c
mover disco 1 de a a c
mover disco 4 de a a b
mover disco 1 de c a b
mover disco 2 de c a a
mover disco 1 de b a a
mover disco 3 de c a b
mover disco 1 de a a c
mover disco 2 de a a b
mover disco 1 de c a b
mover disco 5 de a a c
mover disco 1 de b a a
mover disco 2 de b a c
mover disco 1 de a a c
mover disco 3 de b a a
mover disco 1 de c a b
mover disco 2 de c a a
mover disco 1 de b a a
mover disco 4 de b a c
mover disco 1 de a a c
mover disco 2 de a a b
mover disco 1 de c a b
mover disco 3 de a a c
mover disco 1 de b a a
mover disco 2 de b a c
mover disco 1 de a a c
```

Ejercicio 7

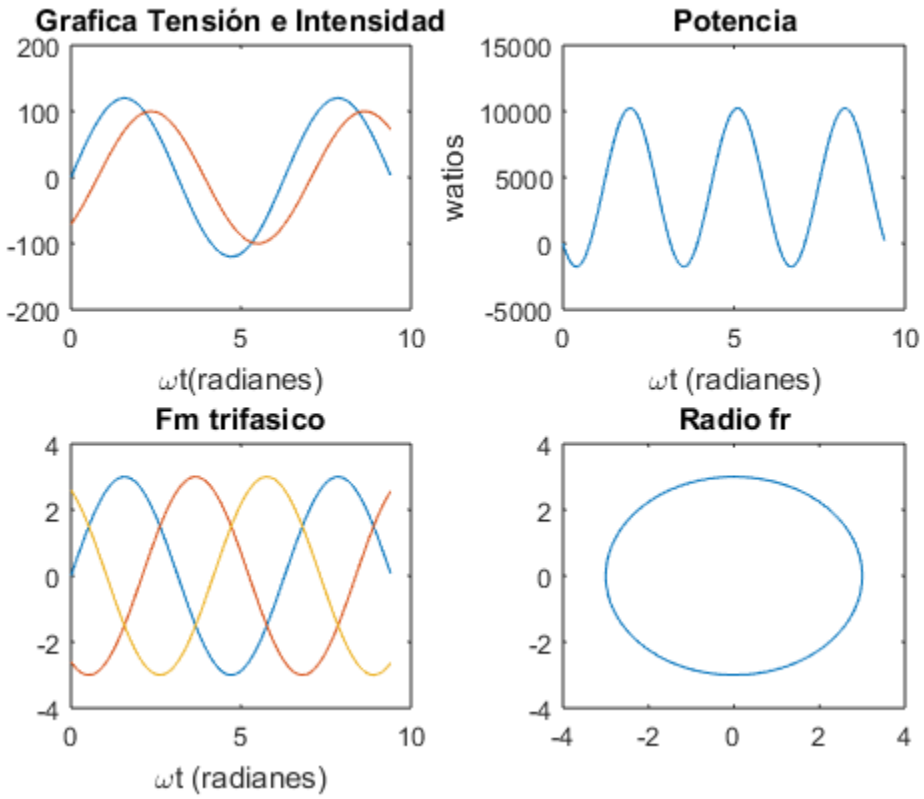
```
%ajuste de polinomio
x=0:0.5:5;
y=[10 10 16 24 30 38 52 68 82 96 123];
p=polyfit(x,y,2)
yc=polyval(p,x)
plot(x,y,'*',x,yc)
xlabel('X'),ylabel('Y'),grid,title('Ajuste Polinomico')
legend('Datos','Ajuste Polinomico',2)


p =

    4.0233    2.0107    9.6783


yc =

  Columns 1 through 7

    9.6783   11.6895   15.7124   21.7469   29.7930   39.8508   51.9203

  Columns 8 through 11

   66.0014   82.0942  100.1986  120.3147
```



Ejercicio8

```
omegat=0:0.05:3*pi;
v=120*sin(omegat);
i=100*sin(omegat-(pi/4));
subplot(2,2,1)
plot(omegat,v,omegat,i)
title('Grafica Tensión e Intensidad'),xlabel('\omegat(radianes)')

p=v.*i;
subplot(2,2,2)
plot(omegat,p)
title('Potencia'),xlabel('\omegat (radianes)'),ylabel('watios')
Fm=3.0;
fa=Fm*sin(omegat);
fb=Fm*sin(omegat-2*pi/3);
fc=Fm*sin(omegat-4*pi/3);
subplot(2,2,3)
plot(omegat,fa,omegat,fb,omegat,fc)
title('Fm trifasico'),xlabel('\omegat (radianes)')

subplot(2,2,4)
fr=3.0;
plot(-fr*cos(omegat),fr*sin(omegat))
```

```
title('Radio fr')
```



Ejercicio 9

```
t=linspace(0,16*pi,100)
x=exp(-0.03.*t);
y=exp(-0.03.*t);
z=t;
plot(t,x,t,y,t,z)
```

```
t =

  Columns 1 through 7

         0    0.5077    1.0155    1.5232    2.0309    2.5387    3.0464

  Columns 8 through 14

    3.5541    4.0619    4.5696    5.0773    5.5851    6.0928    6.6005

  Columns 15 through 21

    7.1083    7.6160    8.1237    8.6314    9.1392    9.6469   10.1546

  Columns 22 through 28
```

10.6624 11.1701 11.6778 12.1856 12.6933 13.2010 13.7088

Columns 29 through 35

14.2165 14.7242 15.2320 15.7397 16.2474 16.7552 17.2629

Columns 36 through 42

17.7706 18.2784 18.7861 19.2938 19.8016 20.3093 20.8170

Columns 43 through 49

21.3248 21.8325 22.3402 22.8479 23.3557 23.8634 24.3711

Columns 50 through 56

24.8789 25.3866 25.8943 26.4021 26.9098 27.4175 27.9253

Columns 57 through 63

28.4330 28.9407 29.4485 29.9562 30.4639 30.9717 31.4794

Columns 64 through 70

31.9871 32.4949 33.0026 33.5103 34.0181 34.5258 35.0335

Columns 71 through 77

35.5413 36.0490 36.5567 37.0644 37.5722 38.0799 38.5876

Columns 78 through 84

39.0954 39.6031 40.1108 40.6186 41.1263 41.6340 42.1418

Columns 85 through 91

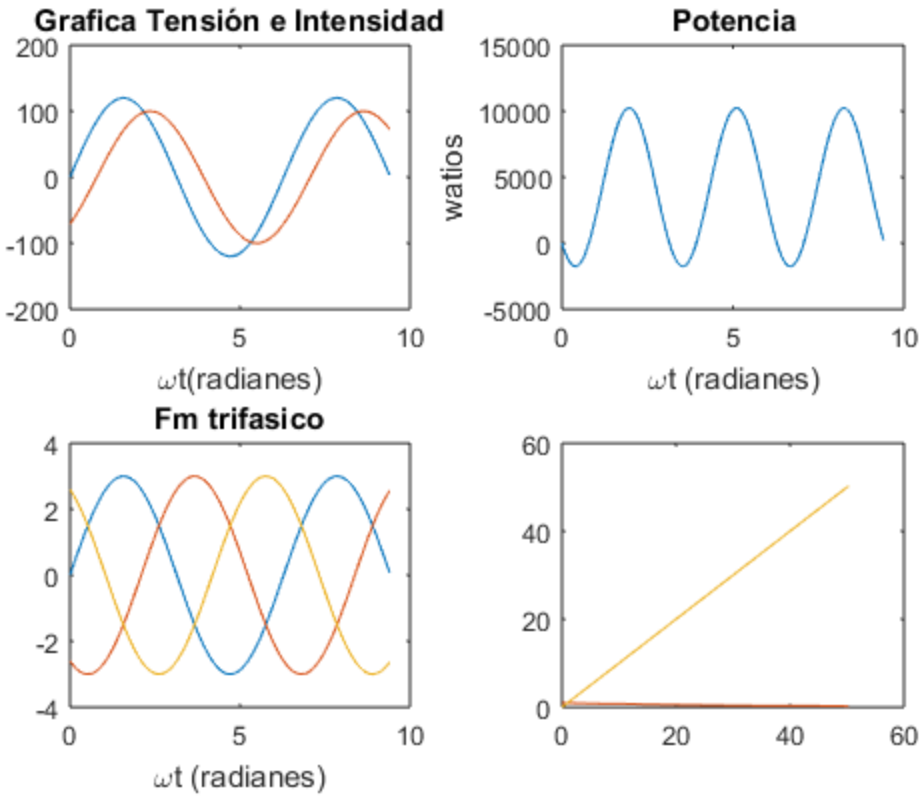
42.6495 43.1572 43.6650 44.1727 44.6804 45.1882 45.6959

Columns 92 through 98

46.2036 46.7114 47.2191 47.7268 48.2346 48.7423 49.2500

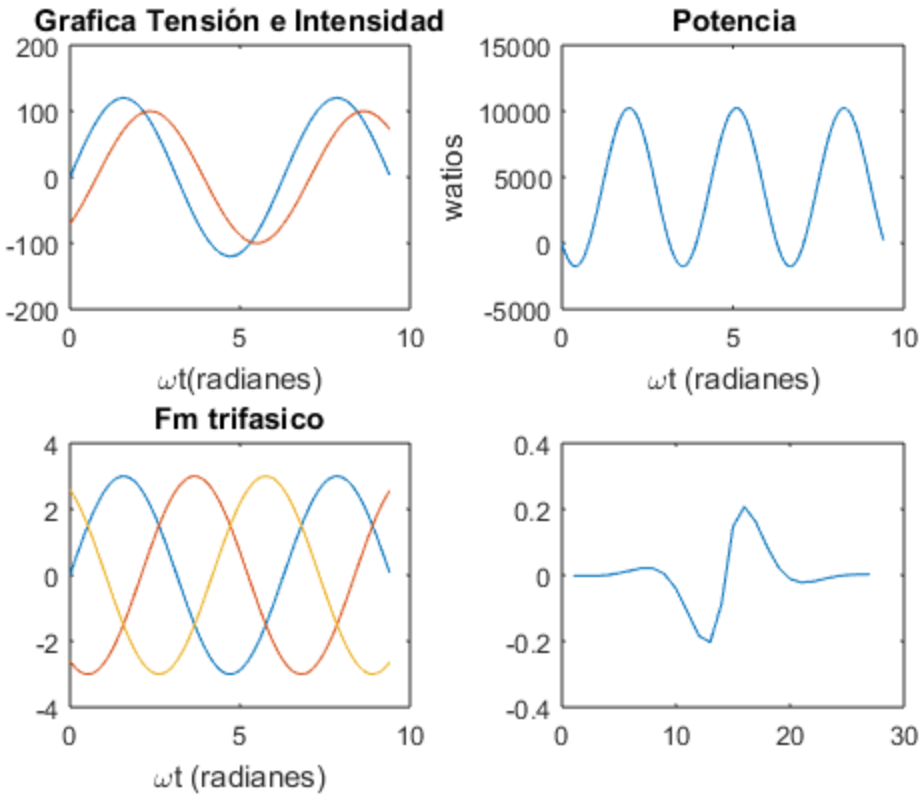
Columns 99 through 100

49.7578 50.2655



Ejercicio 10

```
x=-4:0.3:4;
y=-4:0.3:4;
z=sin(x).*cos(y).*exp(-(x.^2+y.^2).^0.5);
plot(z)
```



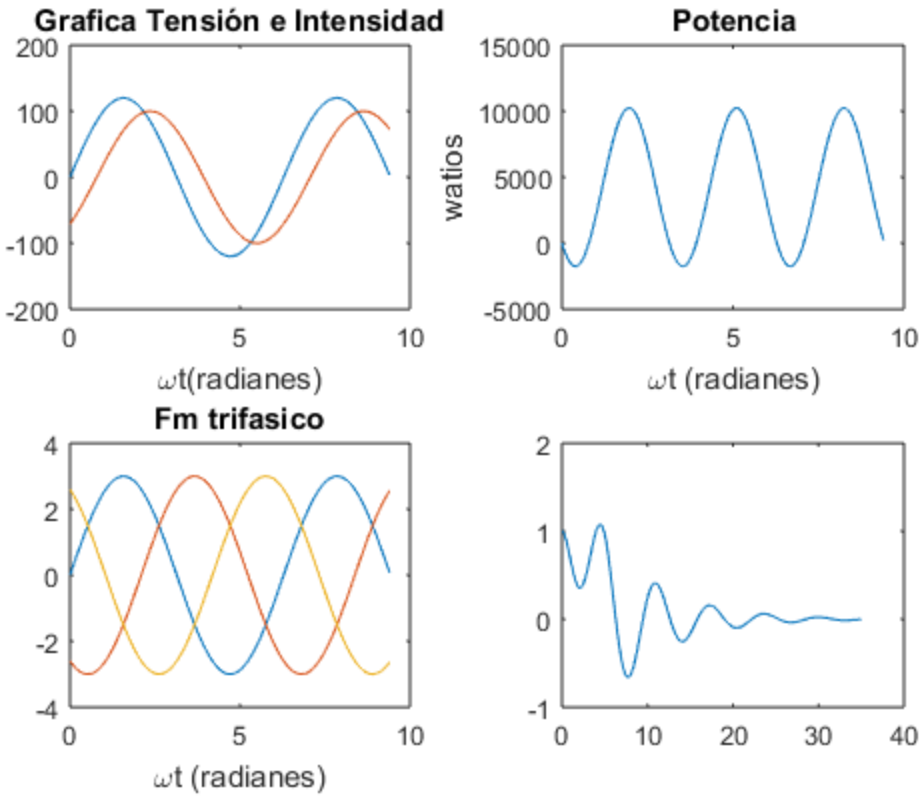
Ejercicio 11

```
%hallar las raices del polinomio
p=[1 0 -35 50 24];
r=roots(p)
```

```
r =

   -6.4910
    4.8706
    2.0000
   -0.3796
```

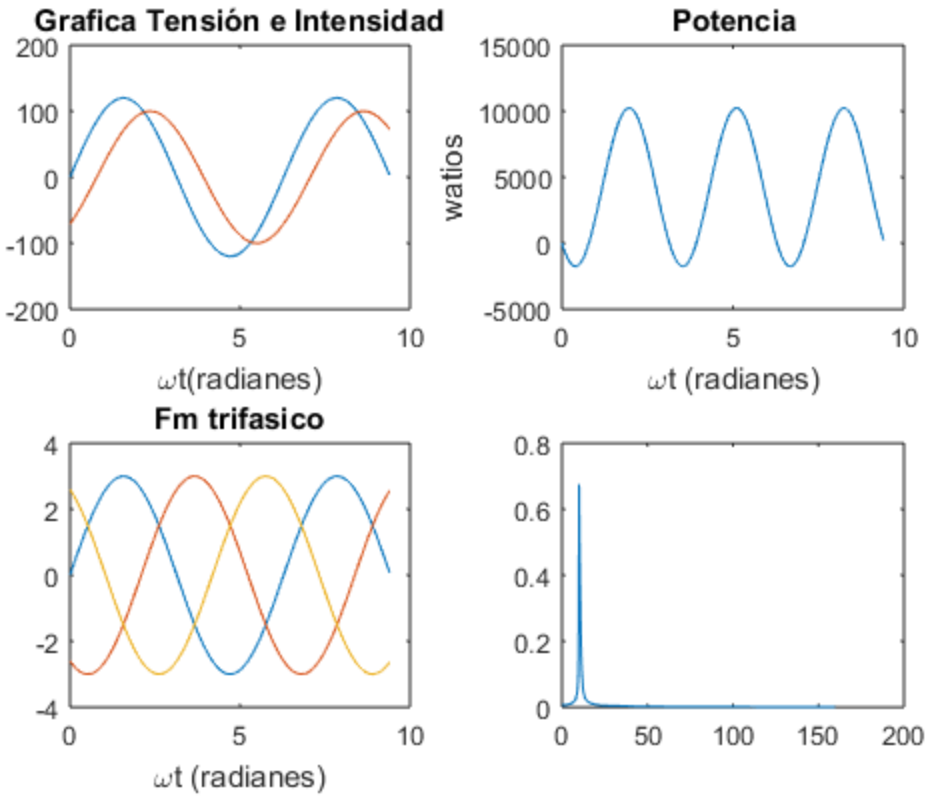
Ejercicio 12

```
%function y = HalfSine(t, y, z)
%h = sin(pi*t/5).*(t<=5);
%y = [y(2); -2*z*y(2)-y(1)+h];

[t, yy] = ode45(@HalfSine, [0 35], [1 0], [ ], 0.15);
plot(t, yy(:,1))
```



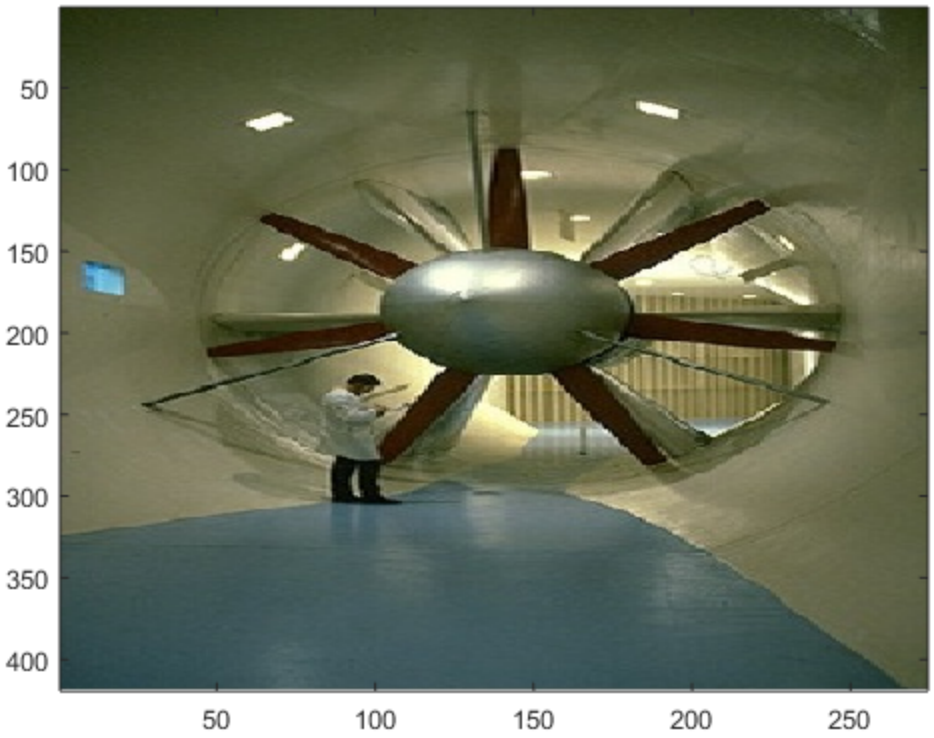
Ejercicio 13

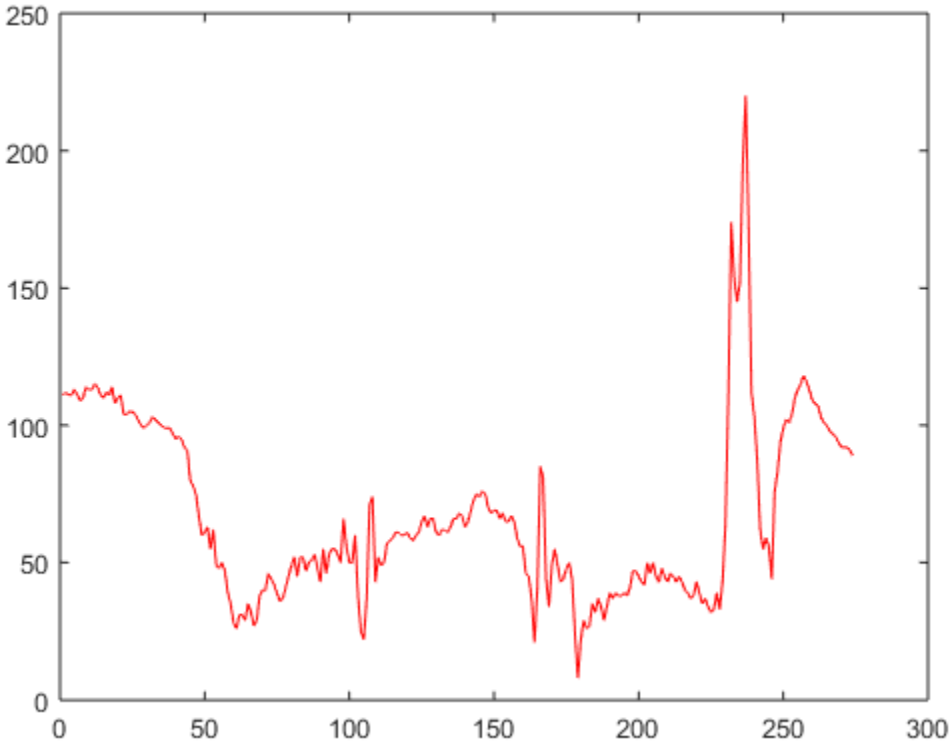
```
k = 5; m = 10; fo = 10;Bo = 2.5; N = 2^m; T = 2^k/fo;
ts = (0:N-1)*T/N; df = (0:N/2-1)/T;

g1 = Bo*sin(2*pi*fo*ts)+Bo/2*sin(2*pi*fo*2*ts);
An1 = abs(fft(g1, N))/N;
plot(df, 2*An1(1:N/2))

g2 = exp(-2*ts).*sin(2*pi*fo*ts);
An2 = abs(fft(g2, N))/N;
plot(df, 2*An2(1:N/2))

g3 = sin(2*pi*fo*ts+5*sin(2*pi*(fo/10)*ts));
An3 = abs(fft(g3, N))/N;
plot(df, 2*An3(1:N/2))

g4 = sin(2*pi*fo*ts-5*exp(-2*ts));
An4 = abs(fft(g4, N))/N;
plot(df, 2*An4(1:N/2))
```



Ejercicio 14

```
subplot(1,1,1)
A = imread('WindTunnel.jpg');
image(A)
hold on
figure
r= A(200, :, 1);
plot(r, 'r')
```


50
100
150
200
250
300
350
400
50
100
150
200
250


250
200
150
100
50
0
0
50
100
150
200
250
300

Ejercicio 15

```
theta = linspace(-pi, pi, 300);
p = abs(besselj(1, 2-4*cos(theta))./(2-4*cos(theta)));
polar(theta, p/max(p))
axis([-0.02, 0.15, -0.05, 0.05])
```

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