

```
function mas_ocw
```

```
%Curso OCW: "Modelización"
```

```
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%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
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```
%Ejercicio: ¿la suma de MAS es MAS?
```

```
%Intervalo de definición:
```

```
a=-4*pi;
```

```
b=4*pi;
```

```
tes=linspace(a,b,150); %valores de t a evaluar
```

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

```
%Suma de MAS con misma amplitud y frecuencia y distinta fase:
```

```
figure(1);
```

```
plot(tes,f(tes,1,2,0),'b');
```

```
hold on;
```

```
plot(tes,f(tes,1,2,pi/3),'k');
```

```
plot(tes,f(tes,1,2,0)+f(tes,1,2,pi/3),'r','LineWidth',2);
```

```
title('M.A.S.: w=1, A=2, diferente \phi_0');
```

```
legend('\phi_0=0', '\phi_0=\pi/3', 'suma');
```

```
xlim([a,b]);
```

```
hold off
```

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

```
%Suma de MAS con distintas amplitudes y desfases pero la
```

```
%misma frecuencia:
```

```
figure(2);
```

```
plot(tes,f(tes,1,2,0),'b');
```

```
hold on;
```

```
plot(tes,f(tes,1,3,pi/6),'k');
```

```
plot(tes,f(tes,1,2,0)+f(tes,1,3,pi/6),'r','LineWidth',2);
```

```
title('M.A.S.: w=1, diferentes A y \phi_0');
```

```
legend('A=2, \phi_0=0', 'A=3, \phi_0=\pi/6', 'suma');
```

```
xlim([a,b]);
```

```
hold off;
```

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

```
%Suma de MAS con misma amplitud, sin desfase, distintas frecuencias
```

```
%con cociente racional:
```

```
figure(3);
```

```
hold on;
```

```
plot(tes,f(tes,1,2,0),'b');
plot(tes,f(tes,2,2,0),'k');
plot(tes,f(tes,1,2,0)+f(tes,2,2,0),'r','LineWidth',2);
title('M.A.S.: A=2, \phi_0=0, diferentes w con cociente racional');
legend('w=1','w=2','suma');
xlim([a,b]);
hold off;
```

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

```
%Suma de MAS con distintas amplitudes, sin desfase, distintas
%frecuencias con cociente racional:'
```

```
figure(4);
hold on;
plot(tes,f(tes,1,2,0),'b');
plot(tes,f(tes,2,4,0),'k');
plot(tes,f(tes,1,2,0)+f(tes,2,4,0),'r','LineWidth',2);
title('M.A.S.: \phi_0=0, diferentes A y w con cociente racional');
legend('A=2, w=1','A=4,w=2','suma');
xlim([a,b]);
hold off;
```

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

```
%Suma de MAS con mismas amplitudes, sin desfase, distintas frecuencias
%con cociente no racional:
```

```
    a=-8*pi;
    b=8*pi;
    tes=linspace(a,b,150);
figure(5);
hold on;
plot(tes,f(tes,1,2,0),'b');
plot(tes,f(tes,sqrt(2),2,0),'k');
plot(tes,f(tes,1,2,0)+f(tes,sqrt(2),2,0),'r','LineWidth',2);
title('M.A.S.: A=2, \phi_0=0, diferentes w con cociente no racional');
legend('w=1','$w=\sqrt{2}$','suma','Interpreter','latex');
    %importante: \sqrt no funciona sin la opción del interpreter
xlim([a,b]);
```

```
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```
%Subfunción que computa el MAS.
```

```
function y=f(t,w,A,f0)
y=A*sin(w*t+f0);
end
```

```
end
```