Problem 1:

```
>> % 1. x(t) = 3cos(2*pi*t) + 2sin(4*pi*t) sinyalini bir periyot boyunca çizme
t = linspace(0, 1, 1000); % 0 ile 1 saniye arasında 1000 nokta oluştur
x = 3*cos(2*pi*t) + 2*sin(4*pi*t); % sinyali hesapla

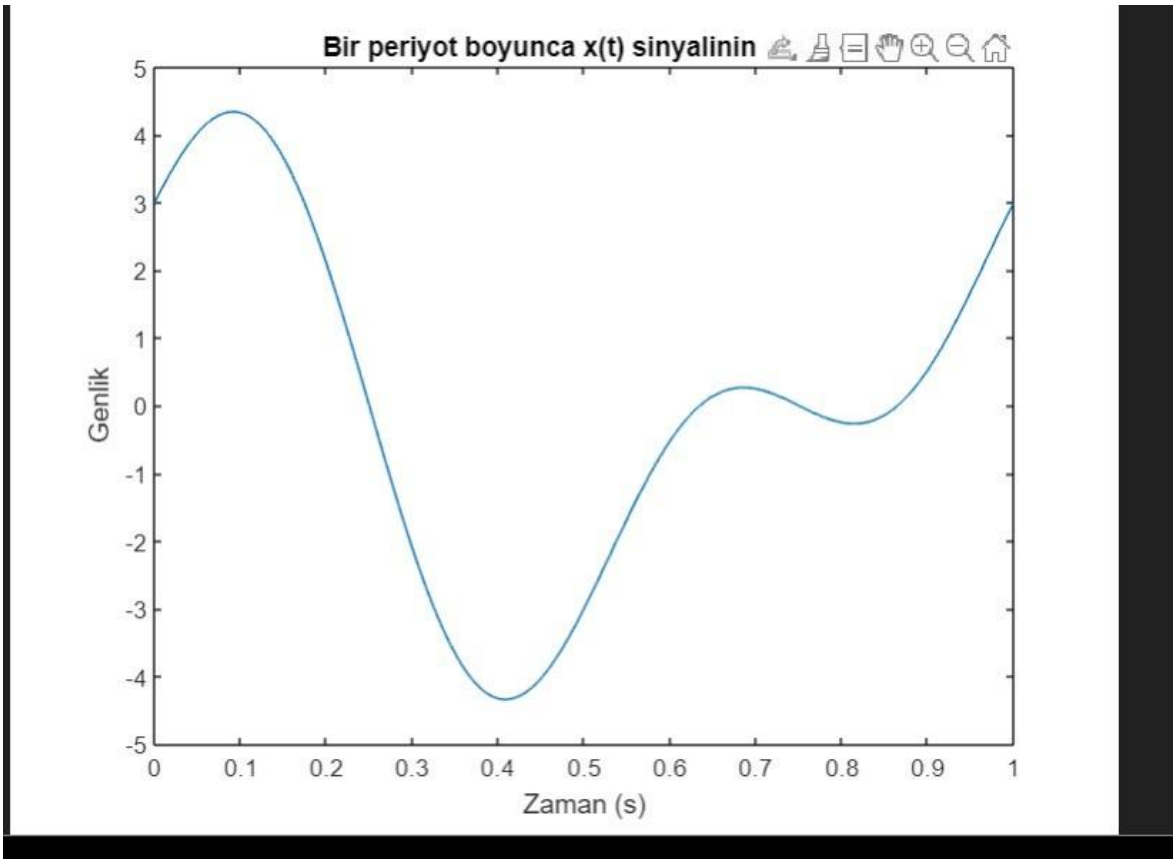
figure;
plot(t, x); % write signals
xlabel('Zaman (s)');
ylabel('Genlik');
title('Bir periyot boyunca x(t) sinyalinin grafiği');

% 2. x(t) Identifying the frequency components present in the signal
disp('2. x(t) frequency components in the signal:');
disp('   1 Hz');
disp('   2 Hz');

% 3. x(t) Calculating the average strength of the signal
Fs = 1000; % Sampling frequency (Hz)
Px = bandpower(x, Fs); % Calculate average power with MATLAB's bandpower function

disp(['3. x(t) average strength of signal: ', num2str(Px)]);
```

```
2. x(t) frequency components in the signal:
   1 Hz
   2 Hz
```



Problem 2 :

```
>> % Define the time vector
Fs = 1000; % Sampling frequency
T = 2; % Duration of the signal in seconds
t = linspace(0, T, T*Fs); % Time vector

% Define the signal
x = 3*cos(2*pi*t) + 2*sin(4*pi*t);

% Compute the Fourier transform
X = fft(x);

% Compute the frequency vector
f = linspace(0, Fs, length(X));

% Plot the magnitude spectrum
figure;
stem(f, abs(X));
xlabel('Frequency (Hz)');
ylabel('Magnitude');
title('Frequency Spectrum of x(t)');

>> % Define the signal
x = [1, -2, 3, -4, 5];

% 1. Determine the length of the signal
signal_length = length(x);
disp(['Length of the signal: ', num2str(signal_length)]);

% 2. Find the value of x[3]
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```
x_3 = x(3);
disp(['Value of x[3]: ', num2str(x_3)]);

% 3. Compute the sum of all elements in the signal
signal_sum = sum(x);
disp(['Sum of all elements in the signal: ', num2str(signal_sum)]);

% 4. Calculate the energy of the signal
signal_energy = sum(abs(x).^2);
disp(['Energy of the signal: ', num2str(signal_energy)]);
```

```
Length of the signal: 5
Value of x[3]: 3
Sum of all elements in the signal: 3
Energy of the signal: 55
```