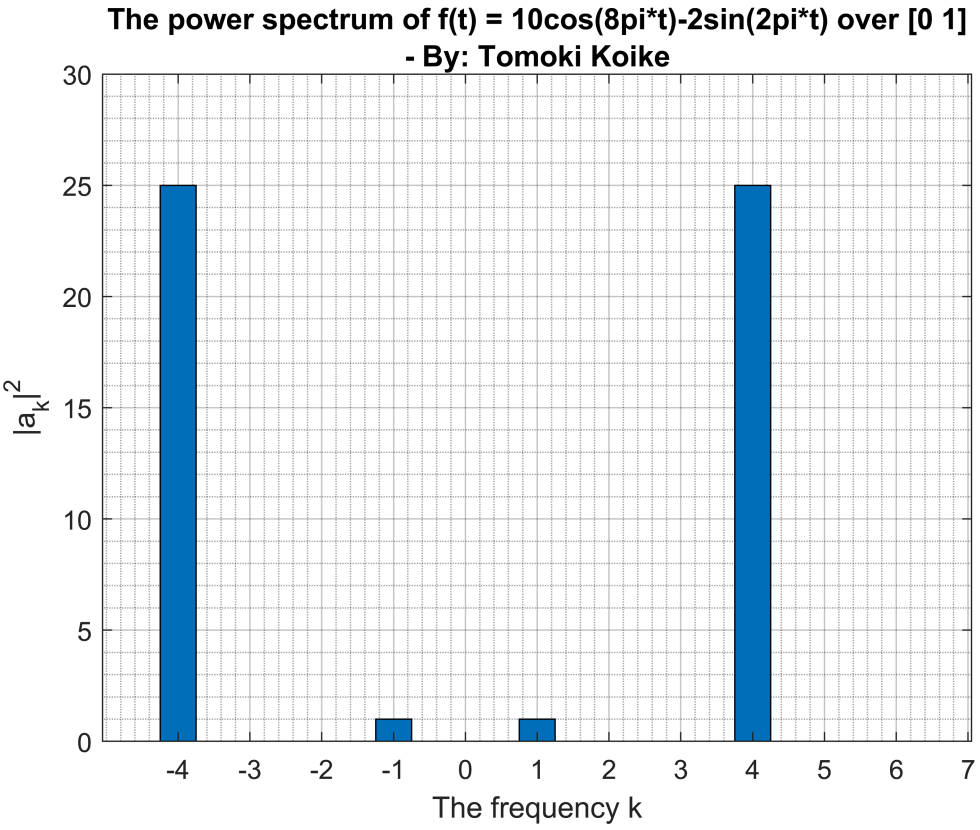
2.2.1

PROBLEM 5.

<PART 2>

Plot the power spectrum

```
a = [5, 0, 0, 1i, 0, -1i, 0, 0, 5, zeros([1, 100])];
figure(1)
bar((0:10), abs(a(1:11).^2), 0.5)
ylim([0 30])
xticks([(0:11)])
xticklabels({'-4', '-3', '-2', '-1', '0', '1', '2', '3', '4', '5', '6', '7'})
grid on
grid minor
box on
xlabel('The frequency k'); ylabel('|a_k|^2')
title({['The power spectrum of f(t) = 10cos(8pi*t)-2sin(2pi*t) over ' ...
    '[0 1]'],'- By: Tomoki Koike'})
```



<PART 3>

```
% Calculating the root mean square
t = linspace(0, 1, 2^17);
f = 10*cos(8*pi.*t) - 2*sin(2*pi.*t);
rootMeanSqr = rms(f);
disp(rootMeanSqr);
```

7.2111