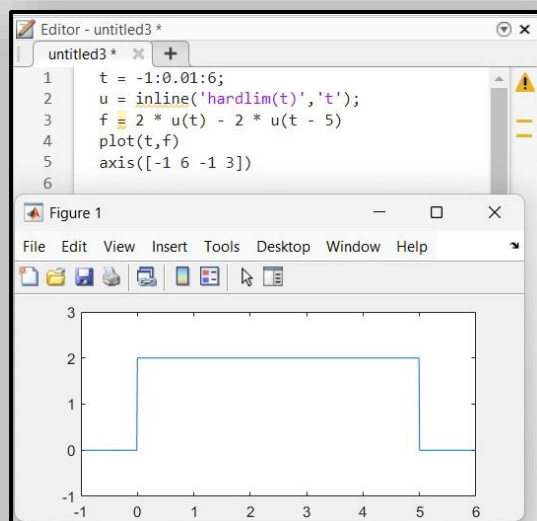
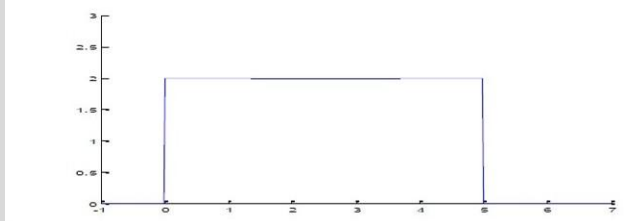


Islamic University of Gaza		Signals & Linear Systems Lab
Faculty of Engineering		HW#4
Electrical Engineering Department		Eng. Nael Dokhan Eng. Nada Awadallah

Question 1: Write an appropriate MATLAB code for the following graphs.

a)

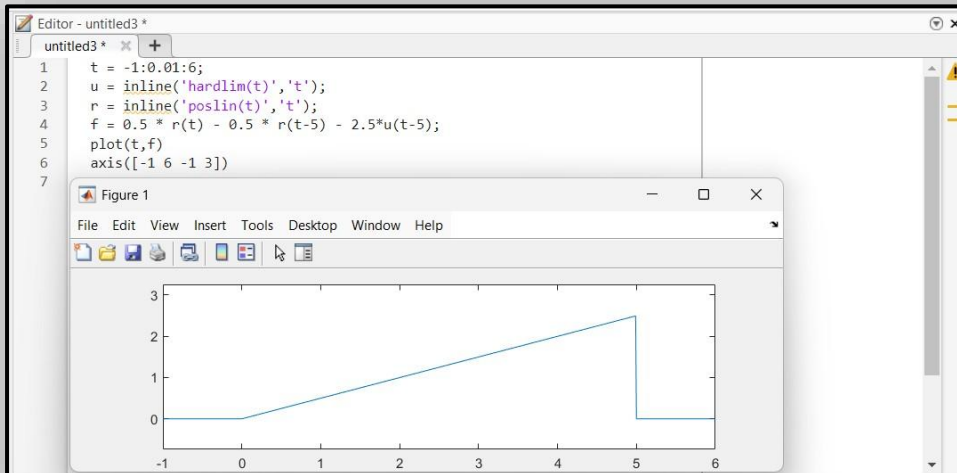
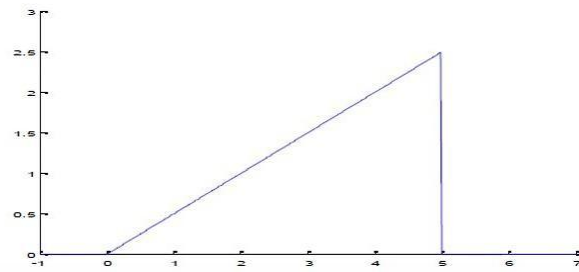


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Lab04: Representation of signals and computing the signal energy.

b)

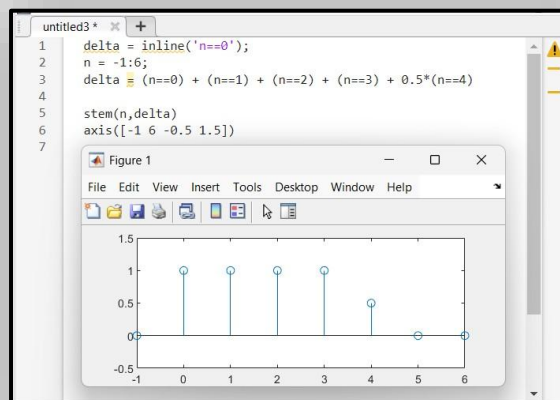
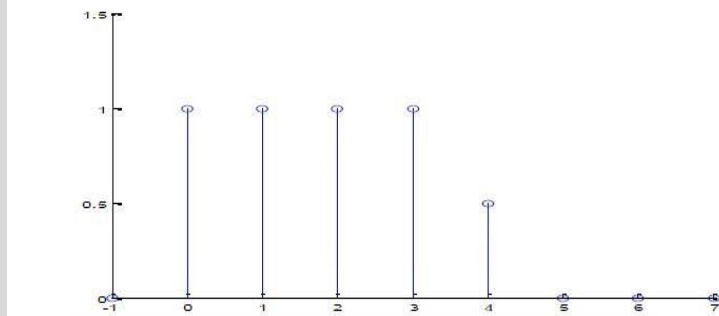


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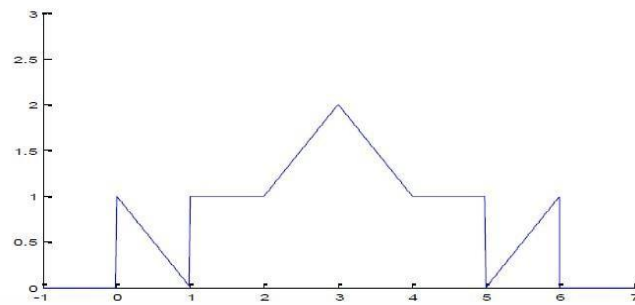
120220263

Lab04: Representation of signals and computing the signal energy.

c)



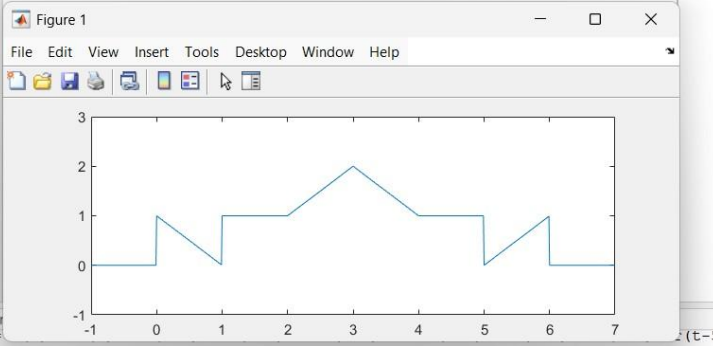
d)



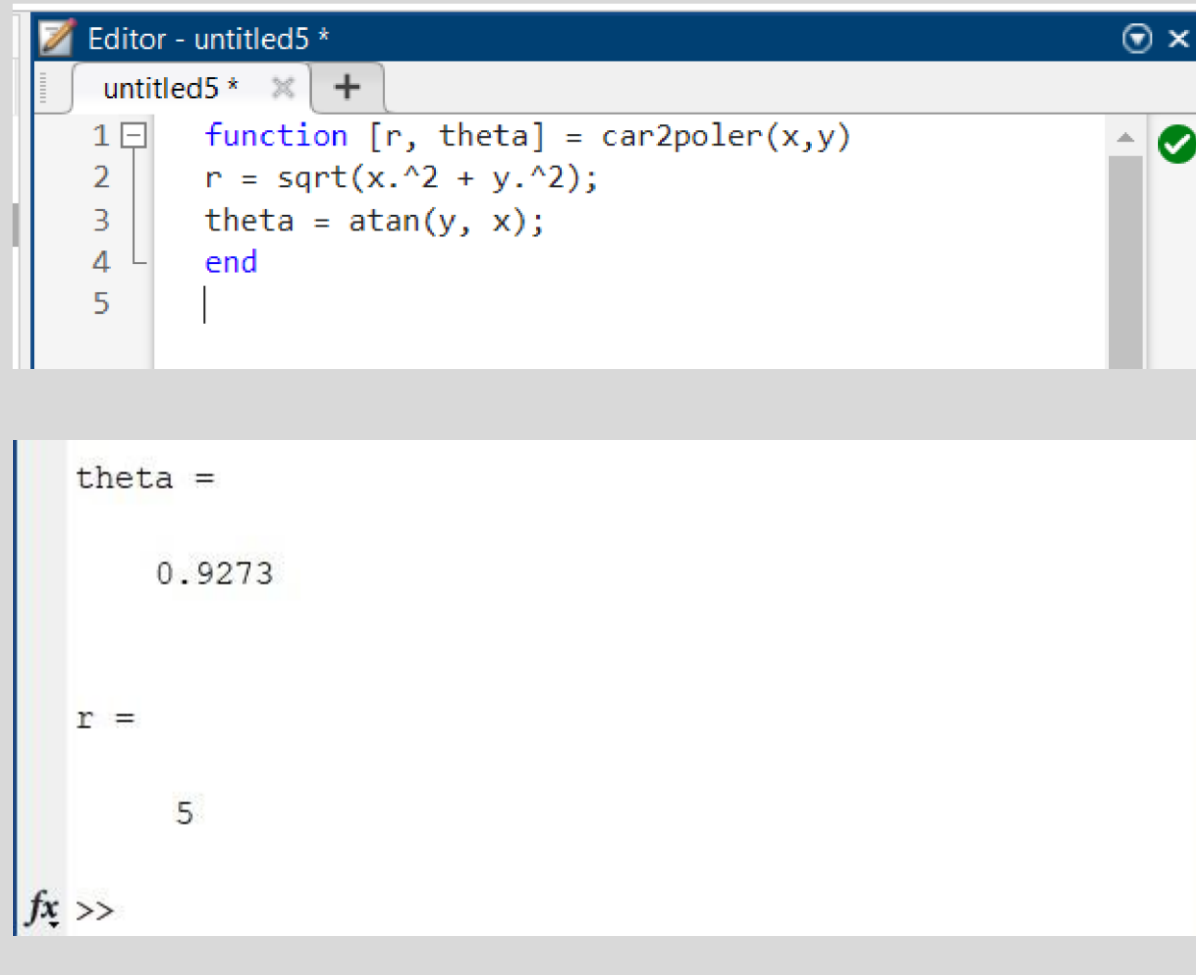
```

1  t = -1:0.01:7;
2  u = inline('hardlim(t)','t');
3  r = inline('poslin(t)','t');
4  f = u(t)-r(t)+r(t-1)+u(t-1)+r(t-2)-2*r(t-3)+r(t-4)-u(t-5)+r(t-5)-r(t-6)-u(t-6);
5  plot(t,f)
6  axis([-1 7 -1 3])
7

```



Question 2: Write a function m file to convert any points from Cartesian coordinate to polar coordinate .



The image shows a MATLAB environment. The top window is the 'Editor - untitled5 *' window, which contains a function definition for 'car2polar'. The function takes two inputs, 'x' and 'y', and returns two outputs, 'r' and 'theta'. The function is defined as follows:

```
1 function [r, theta] = car2polar(x,y)
2   r = sqrt(x.^2 + y.^2);
3   theta = atan(y, x);
4   end
5
```

The bottom window is the Command Window, which shows the results of the function call. The output for 'theta' is 0.9273, and the output for 'r' is 5. The Command Window prompt is 'fx >>'.

Question 3: Write inline MATLAB function for the following math function

$$r(\theta) = 4\cos(4\sin(\theta))$$

The input function is θ (in radians) and the output is r . write inline function

a) Use the function to calculate $r(\pi/6)$ and $r(5\pi/6)$

b) Use the function to plot (polar plot) $r(\theta)$ for $0 \leq \theta \leq 2\pi$

Command Window

```
>> r = inline('4 * cos(4 * sin(theta))', 'theta');  
>> r(pi/6)  
  
ans =  
  
-1.6646  
  
>> r(5*pi/6)  
  
ans =  
  
-1.6646  
  
>> theta = linspace(0, 2*pi, 1000);  
>> polarplot(theta, r(theta));  
fx >>
```

