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% EGR 261 - Signals & Systems
% Graphing piecewise-continuous functions using MATLAB
% Filename: GraphPieceWise.m
% Graph y(t) defined as follows:
%   y(t) = 0           t<1
%         = (t-1)^2    1<t<2
%         = 2t-3       2<t<3
%         = -t^2 + 4t  3<t<4
%         = 0          4<t
% Define y(t) below:
t01=0.00:0.05:0.95; % Time values for (0,1)
t12=1.00:0.05:1.95; % Time values for (1,2)
t23=2.00:0.05:2.95; % Time values for (2,3)
t34=3.00:0.05:3.95; % Time values for (3,4)
t45=4.00:0.05:5.00; % Time values for (4,5)
y01=0*t01; % y(t) values for t= (0,1)
y12=(t12-1).^2; % y(t) values for t = (1,2)
y23=2*t23-3; % y(t) values for t = (2,3)
y34=-t34.^2+4*t34; % y(t) values for t = (3,4)
y45=0*t45; % y(t) values for t = (4,5)
t=[t01,t12,t23,t34,t45]; % Combine t values for (0,5)
y=[y01,y12,y23,y34,y45]; % Combine y values for t = (0,5)
% Graph y(t)
plot(t,y,'r*-') % Plot y vs t using a solid red line with * markers
title('x(t), h(t), and y(t)=x(t)*h(t) versus Time') % Add title to graph
xlabel('Time, t') % Add x-axis label to graph
ylabel('x(t),h(t),y(t)') % Add y-axis label to graph
grid % Add gridlines to graph
% Define x(t) below:
t02=0.0:0.05:1.95; % Time values for (0,2)
t25=2.00:0.05:5.00; % Time values for (2,5)
x02=t02; % x(t) values for t= (0,2)
x25=t25*0; % x(t) values for t= (2,5)
x=[x02,x25]; % Combine x(t) values for (0,5)
% Define h(t) below:
t35=3.00:0.05:5.00; % Time values for (3,5)
h01=0.0*t01; % h(t) values for t= (0,1)
h12=0.0*t12+2.0; % h(t) values for t= (1,2)
h25=0.0*t25; % h(t) values for t= (2,5)
h=[h01,h12,h25]; % Combine h(t) values for (0,5)
% Add graphs of x(t) and h(t) to the graph of y(t)
hold % Continue adding plots to previous plot
plot(t,x,'gd-') % Plot x vs t using a dashed green line with diamond markers
plot(t,h,'b.-') % Plot h vs t using a dotted blue line with dot markers
legend('y(t)', 'x(t)', 'h(t)'); % Add a legend
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x(t), h(t), and y(t)=x(t)\*h(t) versus Time

