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% ### EXlimits5.m ###          [09.16.16 CB]

% code to numerically demonstrate limit (t-->0+,0-) for the function
% f(t)= [1/t - 1/(t^2+t)]

% Questions
% - What happens when xLim gets very small (e.g., +/- 10^-15)? You may
% need to zoom....

clear
% -----
% User params.
xLim= 0.1*[-1 1];
nPts= 100;    % # of x-values to evaluate
% -----

t= linspace(xLim(1),xLim(2),nPts);    % linearly-spaced array of x-
values
% handful of relevant functions to evaluate
f1=t;
f2= 1./t;
f3= 1./(t.^2+t);
f4= (1./t - 1./(t.^2+t));    % main function to consider

% plot (klunky in newest Matlab release; try also semilogy instead)
figure(1); clf;
h1= plot(t,f1,'.-','MarkerSize',15); hold on; grid on;
h2= plot(t,f2,'o-','MarkerSize',3);
h3= plot(t,f3,'x-','MarkerSize',3);
h4= plot(t,f4,'s-','MarkerSize',3,'LineWidth',2);
xlabel('t'); ylabel('some function of t');
title('Limit behavior leading into f(t)= [1/t - 1/(t^2+t)]')
legend([h1 h2 h3 h4], 't', '1/t', '1/(t^2+t)', '1/t - 1/(t^2+t)');

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