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% Author: Spencer Goulette
% ECE 486 - HW #4 Problem 1
% February 18th, 2019

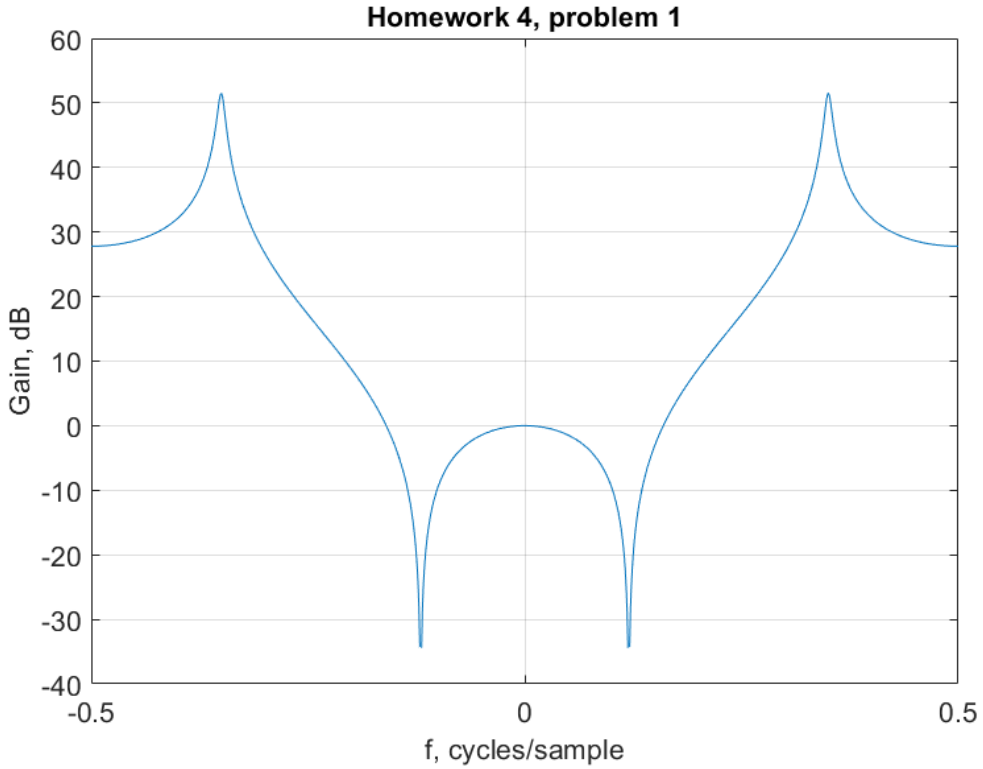
clear variables
```

Problem 1

```
f = linspace(-0.5,0.5,1001); % Frequency from -0.5 to 0.5
z = exp(1i .* 2 .* pi .* f); % Z = e^j2pif
r = .975; % |r| < 1 for stable
H = ((1 - 2 * r * cos(2 * pi * .35) + r^2)/(1 - 2 * cos(2 *
 pi * .12) + 1).*(z.^(2) - 2.*z.*cos(2*pi*.12) + 1)./(z.^(2) -
 2.*z.*r.*cos(2*pi*.35) + r^2)); % Filter H(z)

H = 20*log10(abs(H)); % Gain in dB

Fig1 = figure('Position', [200, 75, 850, 600]); % set figure size and
 location
plot(f,H); % plot
grid on; % add grid
set(gca, 'fontsize', 16); % increase font size
xlabel('f, cycles/sample', 'fontsize', 16); % x label
ylabel('Gain, dB', 'fontsize', 16); % y label
title('Homework 4, problem 1', 'fontsize', 16); % title
```



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