Name _____

EE-3221 – Dr. Durant – Quiz 7
Winter 2020-'21, Week 8

"Take-home" quiz due by end of week.

This is an ***open***-book quiz. Open notes. You may use a calculator. You should use MATLAB.

Given the difference equation: y(n) = y(n-1) + 0.2 x(n) – 0.2 x(n-5)

1. Find an expression for ***and*** plot (hint: freqz) the system frequency response $H(e^{j\Omega})$.
2. Find and plot the pole and zero locations (hint: zplane) for the system.
3. Find the final value of the step response.
4. ***Evaluate*** your system response expression from above to find the gain and phase shift for sinusoids input at the following frequencies in radians/sample: 0, 0.4π, π. ***Comment*** on whether this agrees with your frequency response plot.
5. ***Bonus:*** Can you rewrite the given ARMA equation as a pure MA equation? Hint: the z-transform and polynomial division can help.