# EECE 360 Homework - Poles & Zeros

1) Draw a pole/zero plot of the transfer function specified in question:
   a. E2.2
   b. E2.4
   c. E2.18
   d. E2.21
   e. E2.25
   f. E2.29a
   g. P2.30
   h. P2.37

2) For the circuit in Figure E2.14, $R_1 = R_2 = R$, $L_1 = L_2 = L$, $C_1 = C_2 = C$.
   a. Determine the transfer functions $T_1 = I_1/V$ and $T_2 = I_2/V$ in terms of R, L and C.
   b. For R = L = C = 1, determine the poles and zeros of $T_1$ and $T_2$.
   c. Plot the poles and zeros of $T_1$ and $T_2$.

3) For the circuit in Figure E2.19, $R_1 = R_2 = 1000\Omega$ , $C_1 = 10mF$ , $C_2 = 5mF$.
   a. Determine the transfer function $T = V_o/V$.
   b. Determine the poles and zeros of T.
   c. Draw a pole/zero plot of T.
   d. Roughly sketch the time response from the pole/zero plot.
   e. Compute the inverse Laplace Transform of T to check your sketch.

4) For the mechanical system in Figure E2.25:
   a. Determine the transfer function $T = V_1/F$ ($V_1$ = velocity of mass $M_1$).
   b. Draw a pole/zero plot of T.
   c. Roughly sketch the time response from the pole/zero plot.
   d. Repeat a-c for the transfer function $T = V_2/F$.
   e. Repeat a-c for the transfer function $T = X_1/F$.
   f. Repeat a-c for the transfer function $T = X_2/F$.

5) For the circuit in Figure E2.27:
   a. Determine the transfer function $T = V_o/V$.
   b. Draw a pole/zero plot of T.
   c. Roughly sketch the time response from the pole/zero plot.