A CE amplifier is shown. It is given that $R_1 = 100\,k\Omega$, $R_2 = 120\,k\Omega$, $R_C = 5.1\,k\Omega$, $R_E = 6.8\,k\Omega$, $R_s = 3\,k\Omega$, $R_L = 15\,k\Omega$, $V^+ = 15\,V$, $V^- = -15\,V$, $V_{BE} = 0.65\,V$, $V_T = 25\,mV$, $\beta = 99$, $\alpha = 0.99$, $r_x = 50\,\Omega$, $V_A = \infty$, $R_3 = 120\,\Omega$, $C_1 = 0.15\,\mu F$, $C_2 = 2.2\,\mu F$, $C_3 = 120\,\mu F$, and $I_C = 2.53\,mA$.

(a) Solve for the worst case pole frequency set by $C_1$.
(b) Solve for the worst case pole frequency set by $C_2$.
(c) Solve for the worst case pole and zero frequencies set by $C_3$.
(d) Solve for the worst case lower cutoff frequency in Hz using the equation $f_L = \sqrt{\Sigma f^2_{pole} - 2\Sigma f^2_{zero}}$.
(e) Which capacitor dominates in setting $f_L$?
\[ f_L = \sqrt{f_1^2 + f_2^2 + f_{3p}^2 - 2f_{3z}^2} \quad f_L = 79.082 \]