The transfer function of a second-order Sallen and Key filter is given by

\[ H(s) = \frac{H_o(\omega_o/Q)s}{s^2 + (\omega_o/Q)s + \omega_o^2} \]

Let \( H_o = 5 \), \( Q = 2 \), and \( \omega_o = 200\pi \) rad/s so that

\[ H(s) = \frac{500\pi s}{s^2 + 100\pi s + (200\pi)^2} \]

(a) Compute the poles and zeros of this transfer function:

**Zero:**

**Poles:**

(b) Is this filter (i) overdamped, (ii) critically-damped, or (iii) underdamped? (Circle the correct answer.)

(c) If the quality factor \( Q \) is defined by

\[ Q = \frac{f_o}{\beta} \]

what is the bandwidth \( \beta = f_H - f_L \) of this circuit?