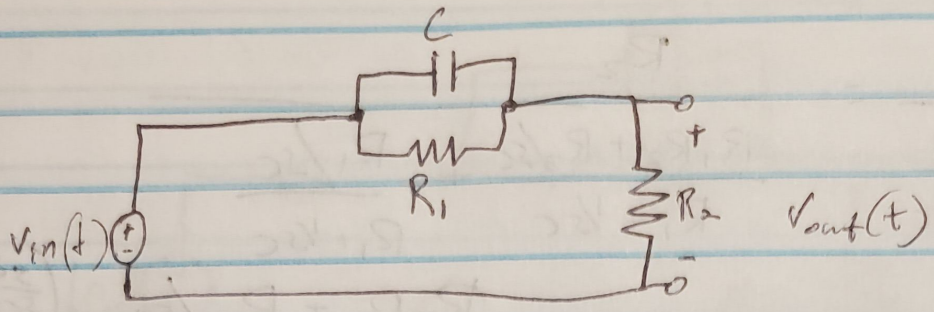

$$Z_{R_1} = R_1 \qquad Z_{R_2} = R_2 \qquad Z_C = 1/Cs$$

$$H(s) = \frac{R_2}{R_2 + R_1 \| 1/Cs} = \frac{R_2}{R_2 + \frac{R_1/Cs}{R_1 + 1/Cs}} \cdot \left(\frac{Cs}{Cs}\right)$$

$$= \frac{R_2}{\left(\frac{R_1Cs+1}{R_1Cs+1}\right) R_2 + \frac{R_1}{R_1Cs+1}} = \frac{R_2}{\frac{R_2R_1Cs + R_2 + R_1}{R_1Cs+1}} \cdot \left(\frac{R_1Cs+1}{R_1Cs+1}\right)$$

$$= \frac{R_2R_1Cs + R_2}{R_2R_1Cs + R_2 + R_1}$$

$V_{in}(t) = 10\sin(200t) + 20\cos(1000t)$

$R_1 = R_2 = 1000\Omega \quad C = 2\mu F$

$V_{out}(t) = V_{out_1}(t) + V_{out_2}(t)$

$V_{out_1}(t) = A_1 |H(jw_1)| \cos(w_1 t + \theta_1 + \angle H(jw_1))$

$V_{out_2}(t) = A_2 |H(jw)| \cos(w_2 t + \theta_2 + \angle H(jw_2))$

$$H(s) = \frac{R_2 R_1 C s + R_2}{R_2 R_1 C s + R_2 + R_1} \qquad H(jw) = \frac{(1000)(1000)(0.000002) jw + 1000}{(1000)(1000)(0.000002) jw + 1000 + 1000}$$

$$H_1(jw) = \frac{400j + 1000}{400j + 2000} = \frac{4j + 10}{4j + 20} = \frac{2j + 5}{2j + 10}$$

$$= \frac{5 + j2}{10 + j2} \cdot \frac{10 - j2}{10 - j2} = \frac{50 - j10 + j20 - 4}{100 - j20 + j20 - 4} = \frac{46 + j10}{96}$$

$$= 0.48 + j0.1 \qquad |H(jw_1)| = 0.49 \qquad \angle H(jw_1) = 11.77°$$

$$H_2(jw_2) = \frac{1000 + j2000}{2000 + j2000} = \frac{1 + j2}{1 + j} \cdot \frac{1 - j}{1 - j} = \frac{1 - j + j2 + 2}{2}$$

$$= \frac{3 + j}{2} = \frac{3}{2} + j\frac{1}{2} \qquad |H(jw_2)| = 1.58 \qquad \angle H(jw_2) = 18.43°$$

$$V_{out}(t) = 4.9\cos(200t - 78.23°) + 31.6\cos(1000t + 18.43°)$$