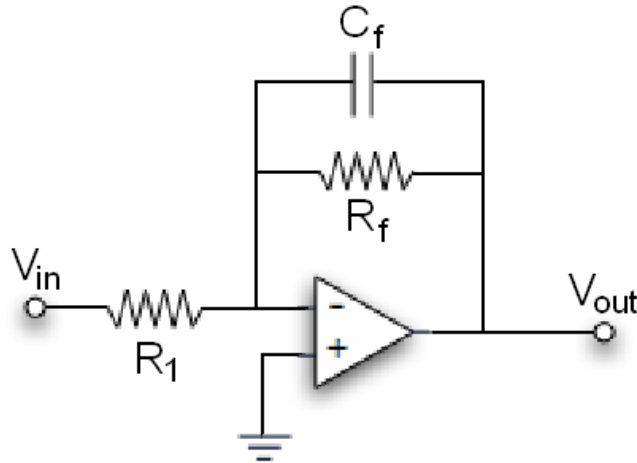


Problem T8

Consider the following active low-pass filter circuit, constructed from an ideal op-amp:



(a) Assume the desired filter must have an input impedance of $1\text{ k}\Omega$ and break-point frequency of 500 Hz ($\omega_{3\text{dB}} = 2\pi \times 500\text{ Hz}$). Moreover, the DC ($\omega=0$) voltage gain must be $|V_{\text{out}}/V_{\text{in}}|=100$. Determine the values of R_1 , R_f and C_f that are required.

(b) With regard to AC signals, what is the transfer function $H(\omega)$? Write both the general expression and the expression for your particular values of R_1 , R_f and C_f (from part (a)).