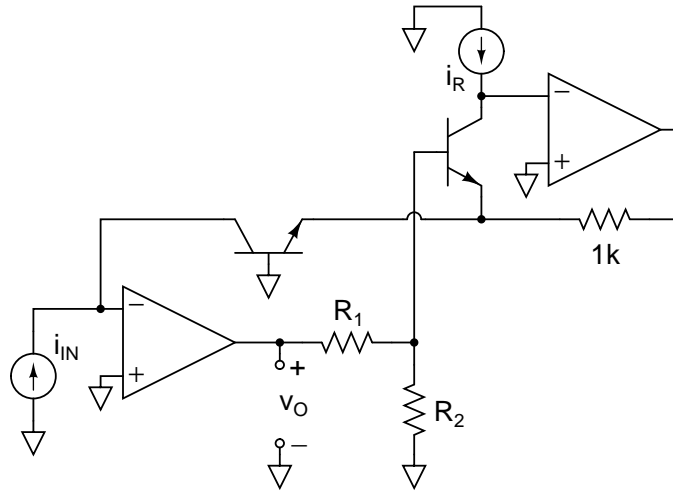


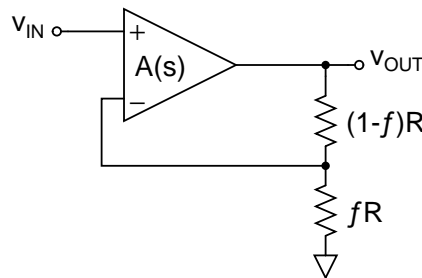
Problem 2: Op Amp Log Circuit



- (a) When $R_1=15.7R_2$, v_O is of the form $v_O=A \log_{10}(x)$. Find A and x .
- (b) Solve for R_1 in terms of R_2 such that v_O exhibits a $\log_2(x)$ behavior.

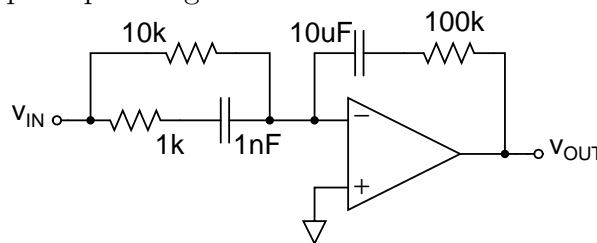
Problem 3: Op Amp Frequency Response

Assume that the following op amp has a finite gain with frequency response $A(s)=\frac{a_o}{\tau s+1}$ (where $a_o=10^6$ and $\tau=10^{-6}$) and that $f=[1 \ 0.1 \ 0.01 \ 0.001]$.



- (a) Solve for the closed-loop gain and upper -3dB Frequency for each value of f .
- (b) Sketch the Bode plot of $V_{out}(s)/V_{in}(s)$ for each value of f .
- (c) Sketch the unit step response of $v_{OUT}(t)$ for each value of f .

Problem 4: Lead-Lag Op Amp Configuration



Sketch the asymptotic Bode plot of $V_{out}(s)/V_{in}(s)$. Make sure to label the magnitudes of each asymptote and its breakpoint frequency. Assume the op amp has infinite gain.